

# MOTOR AGE

Vol. XXXII  
No. 25

CHICAGO, DECEMBER 20, 1917

Ten cents a copy  
Three dollars a year

## DEALERS!

*Have You Thought About the Kind of Cars  
People Will Buy in 1918?*

Never before has there been a time when motorists will be so particular about the kind of cars they will buy as they will in 1918.

In the past they were not so concerned about enduring quality. They bought their cars in the most part to meet a two-year service. Hardly anyone expected to use the car for a longer period.

But now they are making their selections for a long-time service. Prices are constantly increasing, productions are threatened, and no one wants to take a chance at getting a car about the endurance of which there might be some doubt.

Naturally, the dealer who handles a car in which there is universal confidence will have an advantage over his less fortunate competitors.

The Hudson Super-Six now has 50,000 owners. It has established itself in such a way that it is one of the cars that will be favored by those who intend that the car they buy in 1918 will serve them until normal conditions are restored. Hudson dealers have just concluded another prosperous year. They have further established themselves in their various communities. You know, as all must know, that every dealer who has had the Hudson line has placed himself at the very top among the automobile dealers of his community. If you think you could better the Hudson representation in your territory and if you realize the opportunity such a representation offers, why not write us? Perhaps we too feel that the Hudson deserves a stronger representation than it now has.

**HUDSON MOTOR CAR COMPANY**

Detroit, Michigan

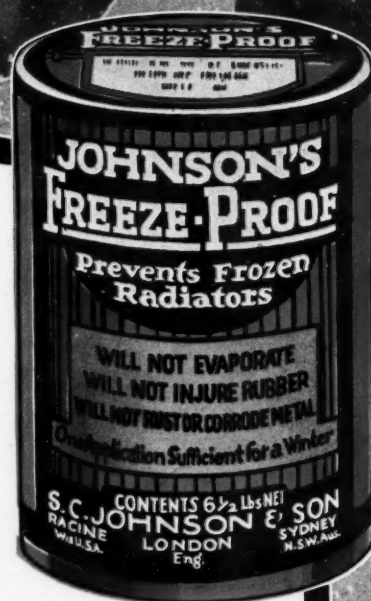
# INSURE YOUR RADIATOR



THE only way you can be positive that your radiator won't freeze up this winter is to use a non-evaporating, anti-freeze preparation. The present high price of Alcohol—its low boiling point—and quick evaporation make it impractical. Besides, you are asked to conserve the supply of Alcohol for use in explosives.

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Johnson's Freeze-proof does not evaporate so one application is sufficient for the whole winter unless the solution is weakened by leakage of the radiator or hose connections, through the overflow pipe, or by boiling over.



# JOHNSON'S FREEZE-PROOF

Johnson's Freeze-Proof should be used whenever you wish to prevent water from freezing—in automobiles, gas engines, tractors, electro-lighting and heating plants, traction companies, etc. One box will prevent  $3\frac{1}{2}$  gals. of water from freezing at  $5^{\circ}$  below zero. For lower temperatures increase the proportion of Freeze-Proof.

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Johnson's Freeze-Proof contains no oil and does not interfere with the cooling system. It will not injure rubber, cloth, packing or metal of any kind. It does not rust or corrode any metal. Johnson's Freeze-Proof is economical and easy to use and it raises the boiling point of water  $12^{\circ}$  to  $25^{\circ}$ .

Johnson's Freeze-Proof is put up in packages containing  $6\frac{1}{2}$  lbs. net which retails at \$1.50 each in the U. S. A. One package will protect a Ford from freezing at  $5^{\circ}$  below zero, and three packages to protect to  $5^{\circ}$  below zero, and three packages to protect to  $20^{\circ}$  below zero.

Write for our new booklet entitled "Keep Your Car Young." We will send it to you free and postpaid. The information in this booklet will enable you to greatly improve the appearance and performance of your car.

S. C. JOHNSON & SON, Dept. MA

RACINE, WIS.







**H**ERE are four typical buildings among the many which have been erected by Studebaker dealers in all parts of the country during the last few months.

Such building activity evidences the solidity of Studebaker dealers, the prosperity which has come to them through the sale of Studebaker cars and their faith in the future of the automobile industry and in the continued pre-eminence of Studebaker.

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Detroit, Mich. South Bend, Ind. Walkerville, Ont.

*Address all Correspondence to South Bend*



Watch the thousands of airplanes that are daily performing records for endurance flights—watch the performance of its parts.

An SKF equipped airplane is better fitted for the gruelling grind of air service—more competent to last through the racking strain of endurance flights because its full power is transmitted to the propeller with an absolute minimum of friction.

**SKF BALL BEARING CO.**

HARTFORD  
CONN.



# MOTOR AGE

Published Every Thursday by the  
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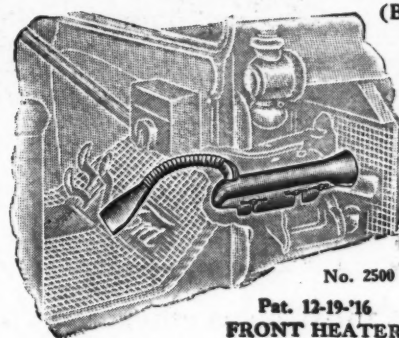
### NEXT WEEK

The issue of next week will contain the annual review of the year, given in illustrations and summary for the benefit of readers that they may consider the most important events of 1917 as a whole.

# Presto PRODUCTS

**WINTER BUSINESS—**  
Cold Weather Made Profitable

With the New Presto  
Automobile Pure Air Heating  
System for Ford Cars



(Brickey patents)

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MODEL

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Pat. 12-19-'16  
FRONT HEATER

REAR SEAT  
MODEL

—the new hot air heating plant for Fords, that operates exactly like a hot air furnace. Takes in pure air from outside the car, passes it over the hot manifold or exhaust pipe, and delivers it heated, to either front or rear seat, or to both. The heater season is at its height—with the 3 months of most active buying still to come. Every Ford car owner wants a heater. IT'S A HEATER YEAR. Presto Price—\$5 and \$6.50—is right for Fords.

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WEST'RN BRCH., 149 New Montgomery St., San Francisco, Cal.



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MODEL

**\$6.50**

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Rear Heater Pat. 12-19-'16



## ONLY A *Highest Grade* TRUCK Is *Economical* FOR THE *Large Or Small* TRUCK USER

**A**LL business must be as efficient as big business under the handicaps of war time conditions. The strain upon truck service increases as the railroads become burdened with war traffic. Motor trucks must take over a larger share of commercial transport, eliminating short hauls by rail wherever possible. Fewer men will be available. Each truck will be called upon for faster and heavier work.

The truck which cannot stand up under high pressure operation fails in the most vital respect—*uninterrupted work*. It depreciates rapidly, with ever-diminishing efficiency and ever-increasing repairs. Time off duty is extremely expensive.

Big concerns look ahead. They see what is coming and fortify their delivery service with fleets of the most efficient trucks money can buy. They know from experience that a high grade truck will outlast

two or more of cheaper construction. It can be worked to the limit and *stay in active service*.

If this is important to the large truck user, with his own repair facilities and "extra" truck units in reserve, how much more important is it to the smaller truck user, with one, two, three or even half a dozen trucks, who has very limited shop facilities and no chance to "substitute" when a truck is laid up.

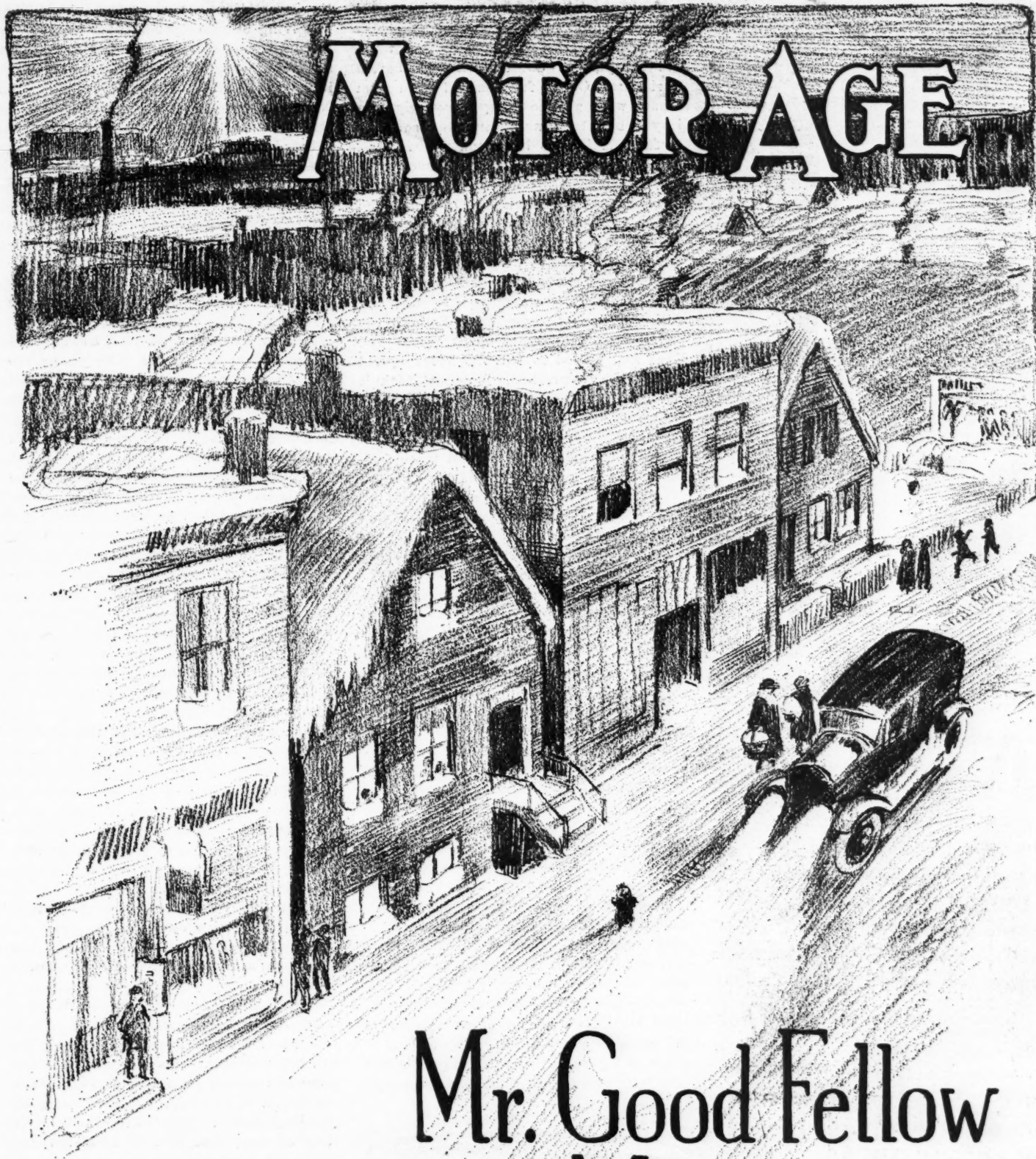
War conditions will prove quickly what years of peace service have been steadily evincing, that the best trucks are the cheapest, regardless of price. They last longer, do more, cost less to operate.

With White Trucks and White service facilities behind him, any user of trucks will be equipped to meet the most strenuous demands.

**THE WHITE COMPANY**  
CLEVELAND

*When Writing to Advertisers, Please Mention Motor Age*





## Mr. Good Fellow Motorist

By Ruth Sanders

*Motor Age Editorial Staff*

NOAH WEBSTER says in his great book on words that a Good Fellow is a person distinguished or esteemed for his companionable qualities but goes on to explain that oftentimes good means promoting success, welfare or happiness, serviceable, useful. Mr. Good-Fellow Motorist is more concerned with the latter part of Mr. Webster's sayings, and it is of the Good Fel-

low who is a person distinguished or esteemed for promoting success, welfare and happiness and being serviceable and useful—at Christmas time in particular—that this is concerned.

Did you ever stop to think and wonder

if those days were so, when just the thought of Christmas sent little shivers up your spine and sent your mind navigating in the seas of great desire? If there are other children who now keep the air of good times still breathing in your home



perhaps you still know those shivers and the good old saint of gifts.

Remember how you used to feel when Ma let you go down town just before Christmas. Or the fun you had when from school with all the gang along—giggling if you and they were girls and shuffling awfully if it was boys you were? And you saw old Santa Claus and knew just how he would look when he came a tiptoeing to fill your stocking full, when good things to eat would be accumulating just waiting to be eaten.

You never used to wonder whether there would be any Santa Claus or if there would be a dinner. You never used to wish and wish for one of those Good Fellows the papers said told Santa Claus where you lived and helped to find the house if Old Santa was overworked. You just took it all for granted in the natural scheme of things and set your eyes on Christmas as the day of days and sure.

Well, suppose you never had these feelings, and you were just at the age when all of Christmas should be partly yours by right. Would you be disappointed if you saw no opportunity for hanging up our stocking or feasting on the day? Would you hope and wonder for a proxy Santa Claus who would help the distribution of the gifts that made Christmas Christmas?

Now is the time of gifts—Christmas. Yet there are many, far too many, children who wait unassured that the spirit of peace and good-will will come their way. Now is the time of gifts—Christmas. Yet there are many, far too many, who know not the joy of filled stockings and an extra dish or so for the children for whom the good St. Nicholas lives eternally. Here is your opportunity, Mr. Good-Fellow Motorist, and the rest of your connections. These are days when motor cars must help to follow after Wise Men's lead and find the poor man's child.

Now is the time of gifts. Yet there are many, far too many, children who wait, with hope's dim light on their wee faces pressed in longing against the window pane, on watch for the Christmas messenger. Are you one of those messengers? Have you known the joy of giving through the using of your car in the spreading of peace and good-will at this glad Christmas time? If not, forget your troubles, forget

the devastation of a world war that knows no giving of other peace than death. Go out into your side streets with a load of mysterious bundles. Know the joy of giving. Find the poor man's child. St. Nick these several years has found that cars can help him much. If your car is not enlisted know by these presents that volunteers are still in order.

Ways and ways of serving with the company of Good Fellows is offered to the motorist, whether he can quite manage to be St. Nick unaided or serves as a member of a corps. If you cannot give anything this Christmas to the poor man's child, take something anyway. Deliver the gifts that others give. Be a messenger of the saint. A little town in Wisconsin has devised a wonderful plan. Everyone gives half an hour or its equivalent to a fund for the support of the war activities. Car owners give theirs in motor car service. How does this apply to Christmas? It all depends on how you look at it. Right here in Chicago it applies very closely; the same is true elsewhere also. Many a family left behind by the enlisted man will know no Christmas unless those who did not enlist find their children's homes. The distribution of food and clothing by various organizations during the holiday season always has been a big question for every community. There usually is plenty to give but only a few to deliver the gifts to the different homes. Here is where Mr. Good-Fellow Motorist steps in.

#### Advantage with Owner

Car owners as a whole and individually can show their Christmas spirit in such a plan better than any other group. There is something about a car that makes it fit into the role of giver of gifts more easily and with greater satisfaction than any other vehicle or any person, as for that matter, can do alone. It is true that St. Nick has a better aid in the motor car of to-day than all his prancing reindeers that used to make the rounds. If you doubt it, just go ask the poor man's child who has had his wistful longing appeased by power of such a car.

How does the motorist start out to be a Good Fellow at Christmas time? Well, just take a look at those who do, and that will tell you how. First the car, then the gift and then the place to go. This last is very easy, if you have done any work of this kind or not. Suppose it is in a small town of some 5000 or even less that you live and would use your car as a member of the St. Nick corps. There is more than one kind of gift to take. There is the church which each year distributes baskets of food and gifts, with clothing perhaps for the more unfortunate. Report to its pastor or the women's organization. Pledge



your car for so much time, set the date when you will call and visit the poor man's home.

You will find the Christmas spirit is not all supplied by you. Nothing like the power of giving to make the giver glad. Makes you resurrect that old, old feeling when you were the one to whom it was given, when just the thought of Christmas sent those little shivers up your spine and sent your mind navigating in the seas of great desire. Of course, if there are your own children, you will have this same old feeling in a more or less degree, but even one's own children happy cannot compensate for the wistfulness of other children.

You might pick out your own desination with your car of gifts. Fill the car with some of the good things that you had decided on for yourself. You know, they say the more you have the more you want. Make that more a little less, and you will be satisfied. Not to mention the poor man's child who gets the surplus, whether toys or food or clothes. Do something anyway. Drive your car right up to the house and see the unexpected smile. Slip in and St. Nick some family with a nice, big dolly, jumping jack and bag of candy, and see what happens to you and all the rest.

#### Be a Santa Claus

You would be surprised to know perhaps that many communities nowadays do not know how to reach the needy. Here is where the motorist is a real joy and blessing forever. Only be sure to reach them early. You cannot begin too soon if all the poor men's children are to be made happy. A bag of nuts and a few pieces of candy will be enough to save a child from utter sorrow on Christmas morning, if you are so situated that you cannot give more. A toy is that much ahead.

The call for motorists to act as messengers of St. Nick may come to you unasked. If it does, seize it as something too precious to let pass. Chicago is asking for cars to help make Christmas come to the many boys who are gathered at the navy and army training camps this year. If cars can make them happy for a few days—or even hours—they should have all the cars there are in the country, and you will remember there are some 4,500,000 now, according to latest estimates.

Twenty thousand jackies at the Great Lakes Naval Station are to be given a five-day furlough in addition to the necessary traveling time to and from their homes. The motorist who lends his car to making happy the many boys in this number who are without homes to go to during Christ-

mas—and there are many such—is acting the Good Fellow as truly as if the boys were in actual need, as many of them will be, of the Christmas spirit that makes glad.

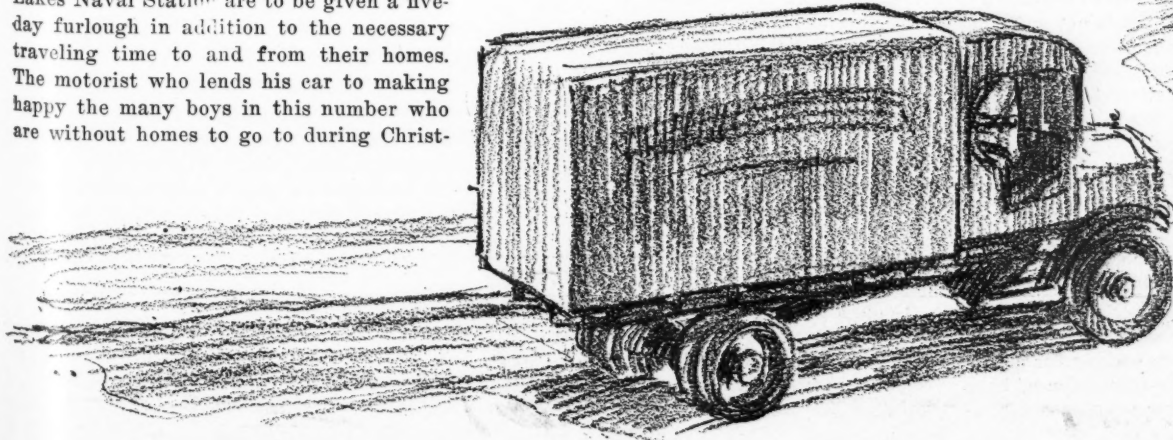
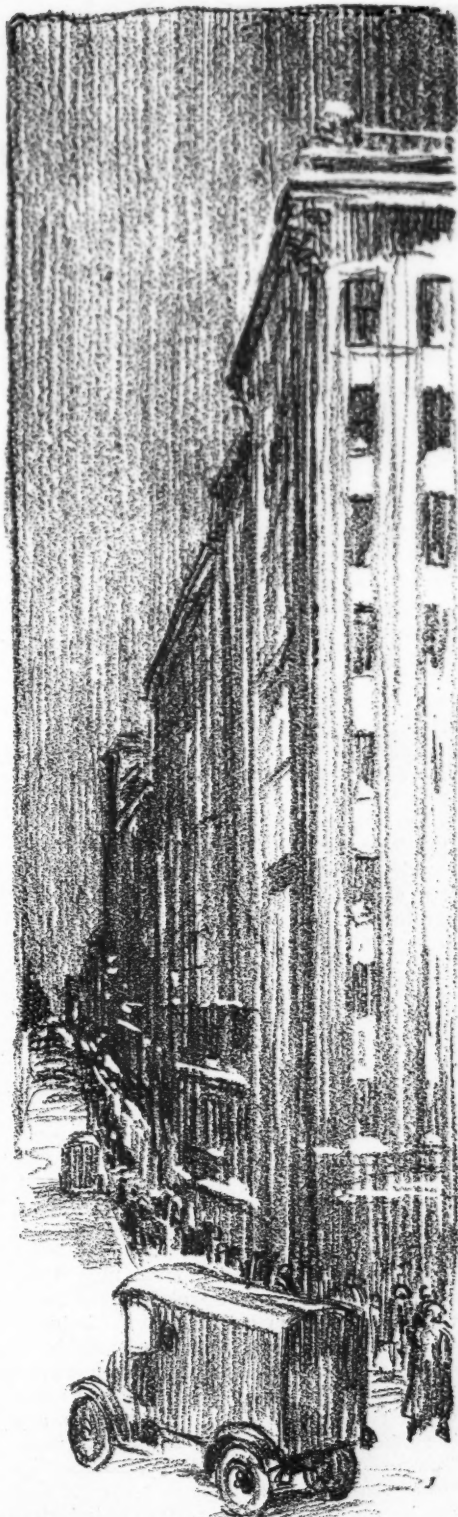
If you are a member of a motor car club, probably you will lend your car or personal services to the Good Fellow work of this time. If your club does not go in for Good Fellow work at Christmas, it can begin at no better time than this year, when, if ever, there is need of cheering. See that your club is made of Good Fellows, and if it is not, see that it has one anyway in you. That many of the country's clubs are enlisted in the corps of St. Nick is indicated by a glance at the work of a few that is going on or is being planned for Christmas Eve and Day.

In Louisville, Ky., various Christmas clubs and societies have made it their business in the past to fill the wants of those in need of it, relieving the club as an organization of devoting its efforts to the work. But members of the club are called on to play the part of Santa Claus and to donate the use of their cars in the distribution of the presents. If a Good Fellow motorist is needed the members of the Louisville club are decidedly there, and this in addition to personal work in spreading the Christmas spirit.

While the club at Dallas, Tex., does not make a practice of doing anything of this kind at Christmas time, this year its annual ride for the five orphan homes there was postponed until recently, so 950 children were made glad, and their hosts, the motorists, as well. The club, however, does furnish cars Christmas Eve for what Dallas calls the Empty Stocking Crusade, another name for Mr. Good-Fellow Motorist to apply to his efforts. The crusade is by a band of women who fill the stockings of the poor children of the city with toys, fruit and candy, as well as giving practical gifts of food and clothing.

The Automobile Club of America, which is the New York club, is concentrating this year on Saturday night dinners, the proceeds from which are contributed to the Red Cross. The members, many of them at least, are contributing their cars to various organizations or distributing Christmas in person.

(Concluded on page 9)



# What Those of the Capital Are Doing

## More Talk as to Curtailment of Industry and Conversion for Munition Work

WASHINGTON, Dec. 17—Special telegram—An order issued by A. W. Shaw, chairman of the commercial economy board, Council of National Defense, last week for a meeting here tomorrow of several representatives of dealer associations marked the chief event of week. Mr. Shaw, queried by a representative of MOTOR AGE as to the cause for the meeting, threw consternation into the minds of those who have witnessed sane handling of the motor car industry in the last few weeks by remarks to the effect that the industry already was curtailed, would be considerably more curtailed by the Government, was necessary for munitions work, was working injury by selling passenger cars to public at this time, and that the workers of industry were required for other war work. He planned to inform dealers of these conditions and invite them to discuss means for pooling their businesses, and in other ways meeting such conditions.

Facts and arguments failed at first to move Mr. Shaw, who was informed of the fact that most of his opinions and, in fact all, were not in accord with the findings of the War Board and others who have been making careful investigation, and matter was addressed to the director of automotive matters, H. L. Horning, in the form of a letter of protest, which Mr. Horning, in turn, took up with W. E. Gifford, director of the Council. This resulted in considerable agitation and several conferences, and it now appears that while the meeting will be held as scheduled, Mr. Shaw has been convinced of the errors of his original views, and, while conducting the meeting, will take it up more to discover economies he can effect in retailing the motor car industry than for any other purposes.

### Matter Not Ended

At the same time, however, the matter is not completely ended, for publicity sent out by the Council of National Defense shows there is still some belief that the industry has suffered considerable curtailment, is required for war work, and soon must convert its facilities to such. These matters again will have to be taken up for discussion, and it again will be necessary to show to members of the Council and War Industries Board that there really are no contracts that require conversion of the motor car industry, that the industry's business is not suffering as stated and that the demand for workers as stated by L. C. Marshall, chairman of the Council's industrial service board, "does not show an actual shortage of labor" and that "there are no figures to show that there is such a shortage." The statement issued by the Council is:

"Reduction of production in the automobile field by many of the country's leading automobile manufacturers has given rise to a problem among automobile dealers. Likewise, manufacturers are seeking to avoid duplication and pointless multiplication of agencies. The dealers are coming for a preliminary discussion of the conversion of both agencies and labor to war time uses and to

discuss other problems growing out of the curtailment of pleasure car production."

It will be noted that the statement persists in the use of the word "pleasure" despite vast publicity showing motor cars are entitled to be called passenger cars.

The railroad situation here remains the same. The President, favoring Government supervision of railroads, already has secured permission of union brotherhoods for taking them over and probably will attend to this early in 1918 following the holidays.

Interesting news on the freight car situation is found in a statement that one freight car maker now is turning out one freight car an hour. At this rate and with the quickened production throughout the country of both freight cars and locomotives which, for example, the Baldwin people are turning out at the rate of 100 a week, we should soon have an ample supply of both to handle all freight both for war and mercantile use.

The War Industries Board also learned last week that the copper supply of the Nation is ample to care for all requirements and that there need be no fear either over the copper supply or the copper labor situation. This assures freedom from trouble for the country from that source.

The first class A trucks at the Ardmore and Denby plants have been completed and soon will start their journey overland to Washington. The Denby job was finished Saturday, the Ardmore job to-day.

Cheerful news comes from the aircraft production board, showing that both airplanes and aviators are being turned out in numbers that assure adherence to the original schedule. Very interesting also is the fact that the English and French governments have asked our Government for Liberty engines, showing that, despite reports to the contrary the allies are finding Liberty engines worthy and equal or better than their own.

L. C. Marshall, chairman of the industrial service section of the Council of National Defense, plans to co-ordinate all existing labor agencies for better distribution of the nation's labor supply.

### No Conscription of Labor

"No conscription of labor now exists nor so far as I know has such a conscription been thought of," stated Mr. Marshall. "We cannot state that there is an actual shortage of labor. There are no figures to show that there is a shortage, but there is a bad adjustment, a shortage here and a surplus there."

He has asked state councils of defense to assist by extending the systems of exchanges at disposal of the war emergency employment service. Inducements to labor to migrate will include usual peace time inducements plus transportation expenses and bonuses.

Copper producers meeting with War Industries Board have assured members that they are and will continue to be able to meet the Government's copper requirements. Labor conditions were said to be much im-

proved and general satisfaction was expressed with distribution system. Rising cost of production was reported but prices were not discussed and no formal request for increase was made when revision of present prices was taken up.

Creation of a war-training department to administer a system of vocational training for drafted men was announced by the federal board for vocational training. This department will co-operate with the war department and shipping board in supplying skilled men for war work. The department will establish free vocational schools and classes to train men in large numbers. It is already training 15,000 radio and buzzer operators for the signal corps.

The Automobile Industries Committee, returning from its Detroit journey, announces the formation of a \$2,000,000 syndicate to manufacture shells for the United States with about \$30,000,000 worth of contracts assured up to September, 1918. Officers of the syndicate include John Kelsey, Kelsey Wheel Co., president; R. B. Jackson, Hudson Motor Car Co., vice-president; Harry M. Jewett, Paige Motor Car Corp., vice-president; Walter Drake, Hupp Motor Car Co., secretary; Edsel Ford, treasurer. The executive committee includes John Kelsey, W. E. Flanders, Maxwell Motor Car Co.; A. R. Demorg, Timken Detroit Axle Co., and Max Wallering of Studebaker Corp. Directors include all of above and E. P. Hammond, Gemmer Mfg. Co.; W. E. Metzger, Columbia Motor Car Co.; B. F. Everitt, Alvin McCauley, Packard Motor Car Co.; Richard Collins, Cadillac Motor Co.; W. C. Rands, Motor Products Co., and John Dodge, Dodge Brothers. Two factories, both in Detroit, are now being considered by engineers representing the syndicate.

Practically every parts and car and truck maker in Detroit is said to have representation in syndicate either as officers of the company or as stockholder. The entire stock was subscribed within 23 hr. after arrival of the committee in Detroit and officers, by-laws and filing for approval of secretary of state was accomplished within an additional 2 hr.

### STANDARD WAR TRAILERS

Washington, Dec. 17—Special telegram—Carrying on the standardization work already performed by the quartermaster corps in the design of its class B, A and AA war trucks, the Army also will have several types of standardized trailers, the first of which, a 1½-ton four-wheeled reversible, or double-ended, type, is now being assembled by the Grant Motor Car Co., Cleveland, Ohio, and the Detroit Trailer Co., Detroit. The standardized design of these trailers is the result of the work of the quartermaster department in co-operation with the engineers of the leading trailer makers of the country, including Troy, Detroit, Sechler, Ohio, Arcadia and others. In addition to the 1½-ton four-wheeler which will be used at first behind the class A war truck, the signal corps will have a standardized two-wheeled pneumatic-tired trailer. General Pershing also has requested the quartermaster department to work out a two-wheeled trailer with a load capacity of 3 tons and this has been designed although its manufacture has not been begun.



# 10,000 Class B Trucks Contracted

## Seventeen Makers Get Assembly Orders from Government at \$720-\$800 a Vehicle

The 1½-ton four-wheeler trailer has a wheelbase of 72 in., a tread of 60-in. and a height of floor above the ground of 42 in. It is mounted on 36-in. wheels all around and has 4-in. solid tires. The frame length is 126¾ in., which is sufficient to carry a class A standard Q. M. C. body. Many of the class A truck parts are employed in the job, including the front springs, spring shackles and brackets, yoke on the tie or reach rod and everything on wheel outside of the king bolt. The frame is of 4-in. channel with the springs spaced on 36¾-in. centers to prevent excessive side sway. The trailer is made up of fifty-eight different parts other than those of the class A truck design.

All springs are shackled so that they take none of the driving loads, the drive being taken through the frame by a two-part drawbar with a spring coupler of composite design. This was necessary not to interfere with any existing potents. Each pair of wheels is provided with radius rods with ball ends to permit the necessary universal motion in turning corners and negotiating uneven roads. The trailer can steer from either end and in each case the steering cross rods are behind the axles to prevent breakage.

The signal corps two-wheeled trailer will be mounted on 35 by 5 pneumatic tires and will have a body about 21 ft. long and 5 ft. wide. The axle will be about 9 in. nearer the rear end than the front. This type of trailer will be able to withstand speeds up to 30 and will be used to carry airplane wings and other airplane parts. Its capacity will be about 1 ton. The tops of the wheels are protected by guards level with the trailer body which will have no sides but will be provided with a removable bow top and tarpaulin camouflaged to avoid detection.

### WHO MAY VOLUNTEER

Washington, Dec. 17—Special telegram—Although privilege offered them for volunteering for military service expired Dec. 15, registrants in the draft army may still get into many branches of the Army or Navy, if they can pass physical examination and are not in immediate draft call. This applies to both the ordnance and signal corps which needs motor car mechanics in great numbers. The new plan known as the voluntary induction plan differs from enlistment in that the individual who wishes to enlist must go to his local board which will act as the recruiting station, the board receiving the credit for the additions thus made to the Army and Navy.

### CLASS A TRUCKS ENROUTE

Washington, Dec. 18—Special telegram—The class A truck made by Denby left Detroit to-day and that made by White was completed to-day and will leave to-morrow. Denby and White will meet Dec. 22 at Pittsburgh and leave together for Washington, meeting the Autocar truck on the way. All three will arrive here about Christmas. They will not haul trailers as first planned because of road conditions and because the trailers are not quite complete. The signal corps is opening bids later this week for 2000 heavy and 2000 of its new light trucks.

WASHINGTON, Dec. 15—Since the issue of last week, in which partial announcements of the new class B contracts were made, the entire allotment has been placed. Seventeen truck makers were given the contracts, the number given to each concern being 500 or 1000. Three concerns, Graham-Bernstein, Selden and Pierce-Arrow, have been given contracts for 1000. It is possible the General Motors Truck Co. will assemble a similar number.

The complete list of contracts, which approximates \$50,000,000, follows:

#### 500 Each

Bethlehem Motors Corp.	.....Allentown, Pa.
Brockway Motor Truck Co.	.....Cortland, N. Y.
Diamond T Motor Car Co.	.....Chicago
Garford Motor Truck Co.	.....Lima, Ohio
General Motors Truck Co.	.....Pontiac, Mich.
Indiana Truck Co.	.....Marion, Ind.
Kelly-Springfield Motor Truck Co.	.....Springfield, Ohio
Kissel Motor Car Co.	.....Hartford, Wis.
Packard Motor Car Co.	.....Detroit
Republic Motor Truck Co.	.....Alma, Mich.
Service Motor Truck Co.	.....Wabash, Ind.
Sterling Motor Truck Co.	.....Milwaukee, Wis.
United States Motor Truck Co.	.....Cincinnati, Ohio
Vellie Motors Corp.	.....Moline, Ill.

#### 1000 Each

Gramm-Bernstein Co.	.....Lima, Ohio
Pierce-Arrow Motor Car Co.	.....Buffalo, N. Y.
Selden Motor Vehicle Co.	.....Rochester, N. Y.

The trucks are to be delivered, beginning in January, up to July 1. It is not known definitely what the assembly price is, but it is said to range between \$720 and \$800 a chassis. In this work the Government supplies all parts and pays transportation from the parts maker to assembling factory. The assembler will pay for labor, insurance, breakage, and it is expected painting, necessary testing and perhaps certain small parts, such as connections, etc., though nothing specific has been given out on this.

The Military Truck Production Board first took up the question of assembly price with competitive bids for assembly. There was so wide a range it was judged best to set a flat price. With such a price possibly between \$720 and \$800 the factory with a good assembly system will make that profit which its efficiency methods give it title to as compared with the factory that has no such system. While the price apparently agreed on may be high, it must be understood this work will interfere to quite an extent with general production of the company. The policy in furnishing parts to the assemblers has eliminated the necessity of any special financing by the assemblers. It was expected that if the Government did not do this some of the companies taking contracts would have to ask the Government for loans covering the purchase of the parts. This has been eliminated by the present plan.

### MR. GOOD-FELLOW MOTORIST

(Concluded from page 7)

The secretary of the Cleveland, Ohio, club, Fred H. Caley, also is chairman of the Community Christmas Work, which is very interesting. The club is co-operating to quite an extent. It has planned to have a Christmas tree in the city square or at

some other place, distribute toys to all poor children who otherwise would get no toys, distribute dinner baskets and send girls as carol singers to stop in front of every house that displays a candle and sing for the owner of the candle. The owner of the candle is supposed to contribute something, all of which goes to the unfortunate. The whole town is to be covered on a percentage basis, and there is to be many of these carol singers.

Such a plan as the Cleveland club has worked out is one any club might follow with a certainty of success. The idea of the candle and carol singers not only is a picturesque means for adding to the funds necessary for work of the kind which should be done in every community of much size but is one than which there is no better way of bringing realization of what Christmas and the spirit of giving should mean to mankind. The Elks have been noted for several years for work somewhat along these lines, that is, they have the Christmas trees and their members distribute baskets of toys and food.

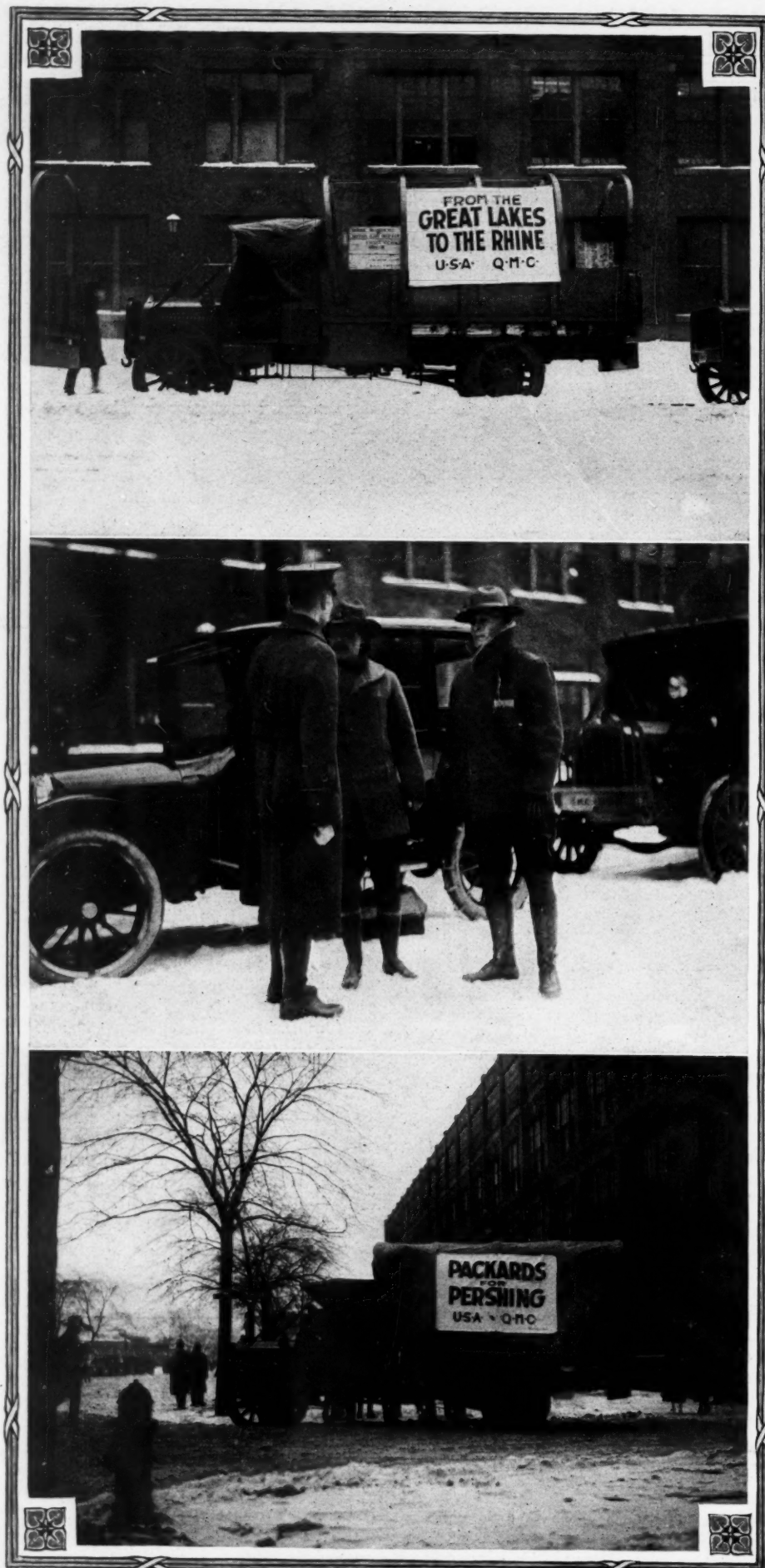
For the last few years the Hoosier Motor Club of Indianapolis, Ind., has been aiding various charity societies in distributing baskets. The members of the club donate their cars and services for three or four days before Christmas and distribute several thousand baskets to the poor. This is another good way of doing it.

### What Detroit Does

The Detroit Automobile club usually does a great deal of Christmas work. For the last several years it used many cars on Christmas day to carry provisions to needy families. But this is what the Detroit club says.

"This organization endeavors to attend to the business activities of motorists, such as furnishing them proper touring road routes and other information; rounding up the thieves who steal their cars and tires; help in building them good roads and bridges; seeing that the roads are properly sign-boarded so that they may not lose their way, and, in fact, making the life of the motorist so absolutely joyous that when Christmas time comes along, or any national holiday, he feels so absolutely good that he is able to give from the fullness of his heart to a greater extent than he would if he were not a member of the Detroit Automobile Club."

And perhaps this is the fundamental of Good Fellowship, that the motorist give of his car and services from the fullness of his heart. A motorist who does that is a Good Fellow. That you may be sure Noah Webster would agree to were he to rewrite his great book on words.



## WITH AN ARMY BAND OF TRUCKS ENROUTE FROM DETROIT TO SEABOARD BY ROAD

**E**ARLY, bright and very cold, the morning of Dec. 14, a line of thirty military-appearing trucks left Detroit, bound, according to big posters plastered on the sides, for Berlin. The cars started from the Packard factory under the command of Captain Bennett Bronson, U. S. Q. C., in a long line. The mercury was concentrated around the zero mark, and no colder weather will be experienced along the French front than these men, who are fresh from Mexico, had before them.

At the request of the War Department, the progress of the trucks from Detroit to the coast from the beginning was the occasion for patriotic demonstrations. The Sphinx-like silence generally preserved by the army in regard to movements of any of its units was broken concerning the pilgrimage and the entire country watched with interest the progress of this pioneer band of trucks enroute from Detroit to the Atlantic.

### Roll Call Leads

Shortly after sunrise, with military promptness, the company in charge lined up before the trucks. Roll was called and the men told off to the various trucks. Twenty-eight of them were the regular transport trucks of the army, and the other two were tank trucks adapted to carrying fuel, oil and anti-freeze mixture. The men were under the command of reserve officers, giving a complete military unit as warlike in appearance as if the company were lined up in a Belgian village instead of in front of a big motor car factory.

Before the trucks started the men were warmed up by singing two or three vigorous songs and then after a salute to the colors, they jumped aboard the trucks and were off on their long trip through conditions as trying as are found in fighting country. The route was through Toledo and Ohio towns along a stretch of country where temperatures as low as 15 deg. below zero had been registered. There was snow on the roads to a depth of from 1 to 4 ft. But the men throughout depended as much on themselves as if they were in France. A kitchen truck was in the train and the men bivouacked at armories along the route.

The driveaway represents the first instance of putting into practice the plans for utilizing the large quantities of military trucks to be built in the West to transport munitions to the coast, thus as-

One of the trucks in the Army train, at top, with its meaningful sign; the officers in charge, with Captain Bronson at the right center; and another indication as to what the drive meant, below in the banner





A band led the procession of trucks as shown at the top, while in the center are the men of the train lined up for roll call, just before the start, which is pictured below in part

sisting the railroads instead of giving them the extra task of carrying the trucks.

A pathfinder car, sent out under the auspices of the Government, recently mapped out a new national highway which is to be used to lighten the burden of the railroads and to provide expeditious transportation of war supplies to the seaboard. Mayor Marx of Detroit and other city officials planned to meet the war train at the city hall and after a few addresses to start the train on its long journey to the coast. All trucks were painted khaki color, and it is said they carry more than 100 tons of war material for use at the front in Europe.

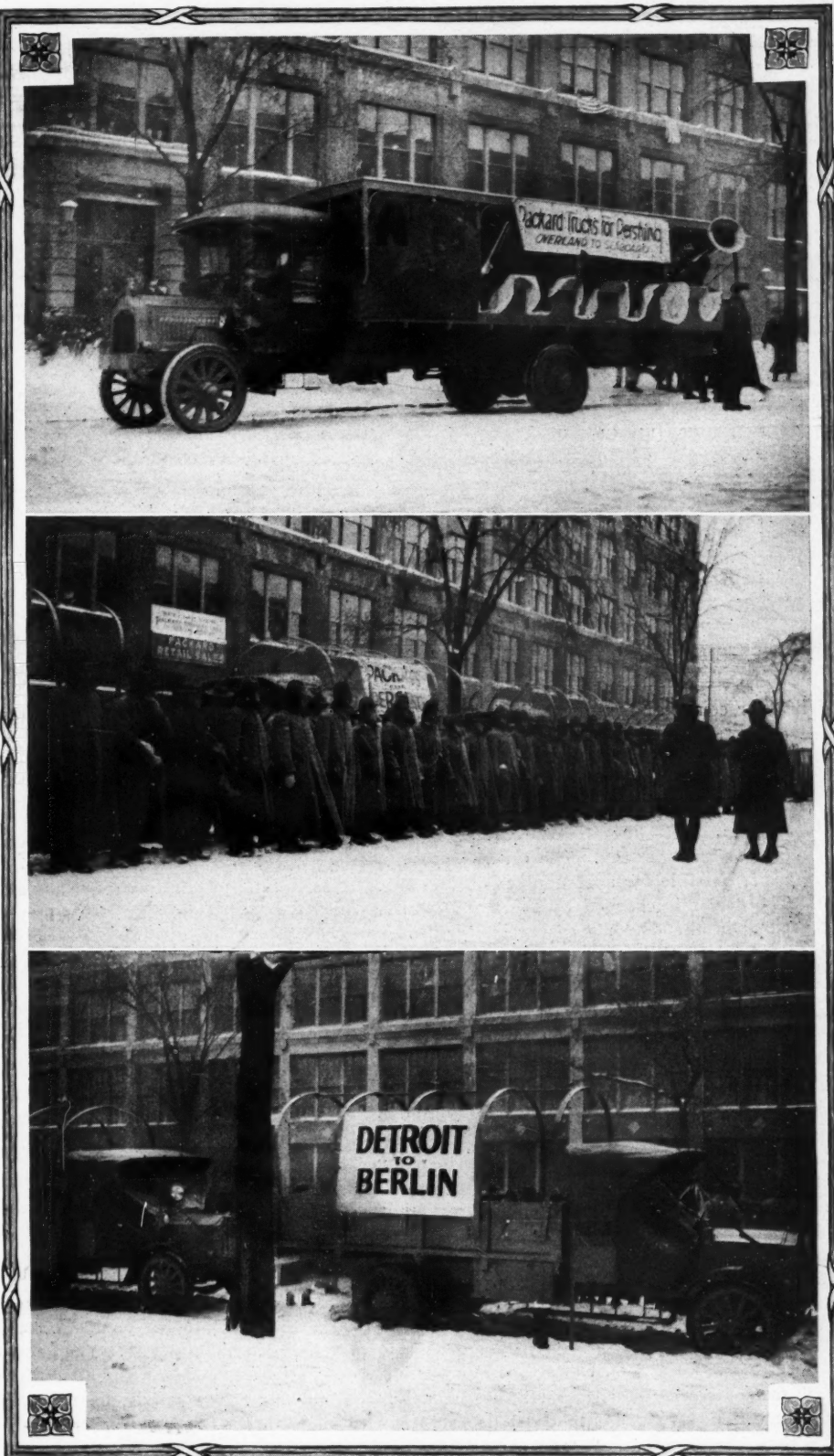
Though even at the beginning of the trip it was known that the roads were frozen and covered with snow no difficulty was anticipated by Army officials in charge. Naturally, the most unusual feature was the fact that the Government withdrew its measures of secrecy and arranged for demonstrations by the people of the towns along the route. The state war preparedness board of Michigan had approved all publicity of the war road route, and the authorities at Monroe early arranged speeches, as well as a luncheon, to mark the passage of the war train. The route was outlined as Detroit to Toledo, Cleveland, Beaver Falls, Pa., Pittsburgh and the Atlantic port.

#### Started at 10

As was to be expected the train started with moving picture operators at every point of advantage. In addition the big kitchen truck was ladling out steaming coffee when the first United States army truck train between Detroit and the Atlantic seaboard left Detroit at 10 o'clock last Friday on the first lap of its journey to Toledo, from which a direct route to the seaboard was mapped out.

Crowds were at the Packard factory to say goodbye to the seventy-eight mechanics, drivers and cooks from Camp Sherman, Chillicothe, Ohio, in the train. And Mayor Marx spoke on behalf of Detroit. Captain Haskin, United States army officer in charge of inspection of Government work being turned out by Packard, handed the sealed Government orders for the trip to Capt. Bronson, in charge of the train.

On the second day of its journey, Saturday, at 5:30 in the afternoon, the truck train reached Toledo, where hundreds of people turned out to cheer their progress. This represented a mileage of only 30 miles, but one must take into account the condition of the roads. The next day was better. Sunday night the thirty trucks rolled into Norwalk, Ohio, with 62 miles to the credit for the day. The going had been excellent, except for three or four places where drifts, ranging from 2 ft. to 6 ft. in depth, delayed progress temporarily. For miles out of Norwalk the highway had been



scraped, and there was one stretch of more than a mile where from 4-ft. to 6-ft. deep snow had been shoveled away before the trucks arrived. From ten days to two weeks is the time estimated for the entire trip. It is not known just what will be done with the trucks then, though the more common belief is that they will be unloaded and return for more material. Other report is that the entire train will go through to France.

The first night was spent at Monroe, 30 miles from Toledo, and not a stop was made because of mechanical trouble. Several of the men had not driven for some time, and many were not familiar with the Packards, and any delay occasioned was because of this and because of the roads.

The army truck train arrived Cleveland, Ohio, Monday night in fine shape. The daily mileage was 62 miles from Norwalk, Ohio, and the total mileage 182 miles.



## Editorial Perspectives

### Giving "Merry Christmas"

**M**R. MOTORIST, this Christmas is up to you more than any previous Christmas. The coming of the Christmas spirit is dependent on you in more homes. You have done nobly in the last few years, you and your car, but there is always room for more Good-Fellowship, you know. If your club is taking Christmas to various unfortunate ones in your town, do not forget you are part of that club. Do your part. Be a Good Fellow. Be the kind of Good Fellow who distributes happiness at this time.

**A**FTER all it takes very little to make Christmas. A small toy, a bag of candy, a doll—even these can give great riches in pleasure, pleasure to those who receive and pleasure to those who give. Get out your car Christmas Day or a few days before Christmas, if possible, and see what you can do to help bring a little brightness to this grim old world. There will be little enough Christmas in the war zone. See what you can do to make "Merry Christmas" present here.

### The 3 per cent War Tax

**T**HE 3 per cent war tax primarily is intended as a source of revenue from the manufacturer, producer or importer of motor vehicles. Although this tax is at present passed along from the manufacturer to dealer and from dealer to consumer, there is no provision in the law whereby this can be done without increasing the list price of the vehicle sufficiently to cover the amount of the war tax. The present interpretation of the law makes it possible for unscrupulous dealers actually to profit by it. The dealer is charged by the manufacturer for the war tax based upon the dealer's cost price, yet some dealers pass the war tax on to their customers based on the list price. In

this we believe these dealers unknowingly are doing themselves a great injustice which may prove a detriment to them in future sales campaigns.

**T**HE claim is advanced by some dealers that they must base the war tax upon their list price to avoid disclosing their margin of profit. By this it is inferred that these dealers are listing the war tax as a separate item on the customer's car invoice. This is not necessary, as the evil can be eliminated by lumping the true war tax with the freight and handling charges, thus giving the customer fair treatment.

### Cross-country Truck Transportation

**T**HE motor truck's real opportunity to demonstrate its ability as an efficient means of transferring merchandise between the important centers in the inland states, and also from the points near the seaboard to the points of embarkation on the Atlantic coast is now at hand. Due to the increasing amount of freight to be handled and the scarcity of cars the railroads daily are finding it more difficult to meet the transport problems, especially with reference to short hauls of 100 miles or so. This situation is precipitated by the war on account of the large amount of material being moved from the centers of industry in the West to the points of embarkation in the East.

operating between depots that will enable them to be always running loaded and thus avoid the losses due to running empty, resulting in increased economic efficiency.

**H**ERETOFORE in normal times the railroads have dominated all other means of transportation, namely, the various inland canals and the Atlantic coastwise shipping to such an extent that these means of transportation have never been fully developed, and now on account of the scarcity of bottoms, those vessels that were formerly engaged in coastwise shipping have been released for overseas service.

**T**HE large number of gasoline trucks required for this cross-country service will necessitate removing many of them from the cities. This, of course, will produce a shortage of gasoline trucks for city delivery systems, and in so doing will create a great field for the electric truck. The success of the electric truck depends largely on the cost of electricity, which, contrary to the trend of the times, is decreasing in price instead of increasing. The radius of operation of the electric truck is sufficient for all ordinary delivery systems in large cities and, if properly handled, should prove to be both commercially and economically successful.

**I**N this, practically everything is in the motor truck's favor, as with the advent of pneumatic tires in large sizes for commercial vehicles, the road speed of these units can be increased materially and their capacity for work almost doubled. Thus the mileage also is increased, and the cost per ton-mile reduced, as this value becomes less as the mileage increases. Another important factor to be considered is that these trucks will be

**I**N France cross-country motor truck transportation has been developed to a very high degree of perfection, and large numbers of transport trains are in use; in fact, it is said that these trains are so numerous that the ordinary highways are a continuous stream of moving vehicles. To keep these roads properly surfaced, the French maintain road repair stations at intervals along the more important highways. An instance of the efficiency of these highway repair gangs is demonstrated by the fact that it required 63 sec. to re-surface a road near the front lines which had been damaged by shell fire from the enemy.





## The Yuletide of 1917

THE snow falls fast to bury stain of earth with cover of white, and the air grows still with the delicate hint of the spirit of Christmas time. The boys look up from the work of war to watch for the coming of homefolk's gift in the midst of warrior toil. The motorist soldier carries his charge of truck or armored tank and thinks of days when at wheel of car he followed the roads of peace. Far different were these days last year when the city's poor called most, and motorist soldier knew no title that smacked of the fighting front. Now many a home bears a starred flag and many a car knows another's touch. The boy who handled a car so well last year will meet Christmas as a fighter.

There are no furloughs that mean home this Christmas "over there." There is no peace that passes understanding "over there." Though Yuletide was, not so long ago, when our country held aloof from tragedy of war, this is another Yuletide.

In far Holy Land stranger sights than on that day, when a star of wondrous brilliance shone! A stranger people with stranger steeds holds Jerusalem the Mighty. At home is the car that seeks the way to spread the Christmas spirit; in that land which gave to us the Day, the car that crowns right victor while winged plane soars ever higher in guiding eye of gun and armored tank gets its fill of glory in thickest of the fighting.



This is the time of peace and good will, of giving and of joy. It is a time in which normally no allowance is made for wars and matters warlike. But that is no reason why the Christmas spirit should not be observed to its full sense of spreading the tidings of better days to come. This is no time to be downhearted, because of the war or for any other reason. We have just begun to fight, and it will take a lot of cheering of each other before we get through. Let's start now. Be a member of the U. M. C., the Uphearted Motor Club. Do your best in cheering the boys in training during this Yuletide. Do your best in cheering those who are more unfortunate than yourself. Then, you will find, take it from those who have been there, that you too will be cheered and in the full measure to that which you give.

Christmas is a beautiful time for cheer. Just before the New Year, when everybody is downhearted through making of firm resolutions to turn over a new leaf and everything, it comes with a spirit of its own. If you wake up and find you have neglected your radiator and things are somewhat frosted, you seldom feel half as grouchy as when it is in everyday times. This is just an example. You can think of others, yourself.

Maybe the snow is falling to cover the stain of earth with white, while the air grows still with the Yuletide spirit. Should you let this spirit pass unattended by effort on your part to help make someone glad? Get out that car. Go toy shopping. Find the Christmas feeling. Let the shoppers scar your shoes and hold your car at the crossings. Be an errand boy for Old Santa Claus, you and your car. Oh, you are doing these things? Then you're a real motorist through and through.

# Trucks Aid to Nation's Problems

## Use of Highways for Short Hauls by Commercial Vehicles Solution to Railway Congestion

WASHINGTON, Dec. 14—If the Government could pass regulations which would eliminate short hauls on railroads, the lack of transportation facilities which is threatening America's greatest efforts in the war would be very largely done away with. If these short hauls could be turned over to motor trucks, and even to passenger cars, the railway congestion problem would be relieved very materially. This is the opinion of H. L. Horning, chairman of the automotive products section of the War Industries Board, Council of National Defense, as expressed to the Editorial Conference of the Associated Business Papers, Inc. This took the form of a national conference between the editors of business papers and Government officials, and its purpose was to give members of the Cabinet and the members of the Council of National Defense an opportunity to make the industries acquainted with their work and their problems through the editors of the papers which represent these industries.

Among the government officials who addressed the editors were: Harry A. Garfield, fuel administrator, E. M. Hurley, chairman of the shipping board; A. W. Shaw, chairman commercial economy committee, Council of National Defense; Dr. Anna Howard Shaw, chairman woman's committee, Council of National Defense; C. A. Richards, chief of the bureau of exports; Senator Atlee Pomerene; Senator Francis G. Newlands, chairman joint congressional committee on interstate commerce; Dan C. Roper, Bureau of Internal Revenue; F. W. Taussig, chairman U. S. Tariff Board; Elliott Wadsworth, vice-chairman American Red Cross; Frederic A. Delano, member Federal Reserve Board; Mr. Requa, assistant to Herbert G. Hoover, food administrator, and others.

Mr. Horning's talk was of most immediate interest to the motor industry as he is one of the men best qualified to tell the possibilities of motor equipment in conjunction with railroad transportation. His present duties as chairman of the automotive products section of the War Industries Board give him complete supervision of the truck, military, tractor, motorcycle, engines and accessories, airplane parts, motor boats and gas engines, and he represents these industries on all matters pertaining to priority and general production and purchases.

### Talk by Horning

Mr. Horning's suggestion is that arrangements be made for short hauls from terminals by motor truck, leaving the railway facilities for the longer distances, and that the motor truck haul gradually be increased. For instance, the first month the distance for motor truck haulage might be 10 miles, for the second month 20 miles, and for the third month, 30 miles. He made the point, which was emphasized by later speakers, that our whole program of winning the war depends on the railway facilities. Without railroad cars there would be no coal. Without coal there would be no steel, and without steel there would be no ships, and it is upon ships

By Darwin S. Hatch

Editor Motor Age

that we must depend to get our forces and their supplies to the European front. Horning holds that transportation will win the war, and the fact that it costs Germany only a fifth of what it costs the allies to carry on the conflict is due to the shortened distance of transportation from German sources to the war front.

That there is no impossibility in the utilization of motor trucks for short haul passage is evident by the fact that this already is being done in England. Of course all the warring nations at the front are doing it.

J. D. A. Morrow, secretary of the National Coal Association, made the point that the cause of the present coal situation, which is threatening our munition and other war supply plants, as well as our industries at large, is the lack of transportation. Many of the mines are idle simply because the coal cannot be moved. Many plants are shut down because coal cannot be had. With big demand and big supply the connecting link has broken down. In stating the cause of the trouble, Morrow uses the words "traditional railroading." If the railroads cannot move the coal someone else must find a way to do it better.

Asked in regard to whether the priority order No. 2, which took cars away from road building and was intended to supply more for coal haulage, etc., gave the promised relief, Morrow stated that it could not be seen that any relief had been gained by shutting down on the important transportation of material for making highways.

Elliott Wadsworth, vice-chairman of the American Red Cross, gave some idea of what the motor ambulances did in the Italian retreat. At that time the Italians lost fifty-six hospitals and much of their motor equipment. To replace these, hundreds of ambulances were driven through Paris to the Italian lines.

Senator Pomerene made a strong talk against war profiteers, and incidentally gave some inkling as to why prices of motor cars and trucks have had to be increased. This was carried back to the coal situation, and thus to the railroads, when he stated that the increase in price from 90 cents to \$5 for run of mine coal meant an increase of \$20 per ton for steel, that pig iron which used to sell at \$15 has increased \$54 per ton in one year.

Release of 66 per cent of the men engaged in deliveries from retail stores in small towns has been brought about through the establishment of co-operatives delivery systems according to A. W. Shaw, chairman of the commercial economy committee of the Council of National Defense. This, as well as the reduction of deliveries to one per day in the larger towns, has been one of the features of war time economy which MOTOR AGE has advocated. Cutting down the returns of goods sold in larger towns likewise

has been responsible for great saving. Mr. Shaw stated that 20 per cent of the goods sold were returned.

What can be done by reducing deliveries from retail stores is shown by the experience of one New York department store whose delivery system lost eighty-eight men by the draft and enlistments. By cutting down the number of the deliveries and re-routing, it was found necessary to replace only twelve of these men.

### REO LOSES VETERAN WORKERS

Lansing, Mich., Dec. 14—Four veterans in the service of the Reo Motor Car Co. left this week to join the motor truck section of the ordnance department. These are Leon B. Royce, T. W. McDowell, Arthur H. Horton and Bert Vanderwalker. They have been in the Reo company since 1906. Two other employees accompany them, Wilfred Richards and A. K. Spaulding, who will enlist in the same department. All drove to Chicago in Reo cars which are to be delivered to the branch there.

### JOHN W. BATE LEAVES MITCHELL

Racine, Wis., Dec. 17—John W. Bate, for many years vice-president and chief engineer of the Mitchell Motors Co., Inc., and its predecessor, the Mitchell-Lewis Motor Co., has severed his connections with the Mitchell Motors Co., Inc. Mr. Bate's future plans have not been announced, but it is understood he will devote his attention to his many other interests in Racine. Coincident with this announcement it becomes known that F. W. Pelton has resigned as western sales manager of Mitchell to take more active part in a shoe manufacturing concern in Racine, in which he is interested.

### MAGNETIC CAR

Chicago, Dec. 14—A new car featuring the Entz-magnetic transmission is to be produced by a concern just organized in Chicago called the Magnetic Motors Corp. This corporation combines the Rauch & Lang-Baker Co. and the Owen-Magnetic Motor Car Co. The Rauch & Lang-Baker Co. has been the distributor for the R. & L. and also has the service of the Stevens-Duryea. The Owen-Magnetic Motor Car Co. has been distributor in this territory for the Owen-Magnetic.

In addition to serving as the distributor of the R. & L. and the Owen-Magnetic the new Magnetic Motors Corp. will constitute the sales organization for the new Deering Magnetic. Officers of the new concern are: R. S. Deering, a former Naval electrical engineer; W. G. Pancoast, manager of the Owen-Magnetic agency, and for five years sales manager of R. & L. electrics, Cleveland, Ohio, and Paul A. Frank, a Chicago dealer in electrics.

The new Deering-Magnetic is to have a Dorris six-cylinder engine, and the chassis,



except for the Entz transmission, will be a Dorris production. The chassis will be fitted with bodies designed by Carl H. Martin. The Dorris engine has been selected because it is believed to be peculiarly well adapted for use in the Magnetic transmission. First, on account of its low compression and large overhead valves, and also because of the seven-bearing crankshaft.

This car will make its initial appearance at the Chicago salon, and arrangements have been made for production of 1000 as the first lot. Its price will be about \$4,000 and it will appear as a seven-passenger touring car, coupe and sedan. Rudge-Whitworth wire wheels will be stock equipment, and judging from the designs which already have been produced by Martin, the appearance of the car as whole will be striking.

#### ANDERSON INCREASES PRICES

Detroit, Dec. 14—The prices of the Detroit Electric, manufactured by the Anderson Electric Car Co., will advance \$200 Jan. 1, as follows:

MODEL	OLD PRICE	NEW PRICE
71.....	\$2,740	\$2,940
72.....	2,815	3,015
73.....	2,790	2,990
74.....	2,840	3,040
75.....	2,175	2,375
76.....	2,175	2,375

#### BARLEY USING DUESENBERG

Kalamazoo, Mich., Dec. 14—The Barley Motor Car Co. is the first user of the new Duesenberg engine, which is fitted to the 6-90 models for 1918. The price of this car, with a six-passenger touring body, is \$3,150. The following is the revised price list on Roamer models:

Model 6-54		
4-passenger touring .....		\$2,095
2-4-passenger roadster .....		2,295
Town body .....		3,250
Standard sedan .....		3,250
Touring sedan .....		3,250
Model 6-45		
4-passenger touring .....		\$1,950
2-4-passenger roadster .....		2,150
Town body .....		3,150
Standard sedan .....		3,150
Touring sedan .....		3,150

#### FLANDERS RESIGNS PRESIDENCY

Detroit, Dec. 14—W. Leyard Mitchell has been elected president of the Maxwell Motor Co., filling the place formerly held by Walter E. Flanders. Flanders had been president of the corporation since its organization in 1912 and remains as chairman of the board of directors and general manager of the company. Mitchell is a Cincinnati furniture man and besides becoming president of Maxwell is now a director, filling a vacancy that has existed for some time. Eugene Myers, formerly chairman of the board of directors, retires. These changes do not indicate any change in the policy of the company, and it is understood they have been made to relieve Flanders from many of the details of management that he might give his attention in broader way to the affairs of the company. His duties have been considerably increased since Maxwell took over the operation of the Chalmers plant through a five-year lease. The new officials will assume their duties about Jan. 1, it is understood.

## M. & A. M. Is Optimistic

### Parts and Accessory Makers Confident of Growing Policy in Favor of Industry

#### Meet to Learn Intentions of Government Toward Car

DETROIT, Dec. 14—Optimism marked the meeting of the Motor and Accessory Manufacturers' Association here yesterday. The members of the Automobile Industries Committee, Hugh Chalmers, A. W. Copeland and John R. Lee, were present, as well as Christian Girl, chairman of the Military Truck Production Board. Manufacturers came to the meeting to learn the intentions of the Government toward the motor car business, the true facts regarding the material situation, the possibilities of getting war work, the methods of getting it and the probable outcome of the railroad situation. These were the principal matters discussed, and in addition there was a running discussion including all phases of the parts and accessories business during war time and immediately after.

The consensus of the meeting was that the Government should adopt the policy of putting a premium on the industry rather than attempt to retard it, and the optimistic feeling plainly visible at the meeting showed the awakening and growing consciousness in the minds of the parts and accessories makers that this logical condition is the one which is going to prevail.

Hugh Chalmers again delivered the true keynote speech of the meeting and fired the attendance with his enthusiasm and optimism. "Democracy as usual, first, and business as usual, second," was the way Mr. Chalmers summed up the attitude that the industries should preserve toward the war. He pointed out that no factory should be alarmed, as the automotive branch of the War Industries Board and the Automobile Industries Committee could assure them they would not be curtailed in their outputs but instead could keep their organizations intact. Mr. Chalmers said that 5000 mules a day are being shipped out of the country and the only thing which can take their place is the motor car. There has been too much gloom spreading through the industry, according to Mr. Chalmers, but much of this downcast feeling is only a matter of the time of year, as at this period of the year, even in peace time, there is always a seeming feeling of depression in the motor car business but that beginning with show time there is a marked increase in vigor and optimism, and this will again occur. In the words of Mr. Chalmers, "The New York show will put 'pep' into the makers and into business generally."

One of the important actions taken was a resolution to ask Congress to repeal the 3 per cent tax. It is not expected that this will go through, but it will serve to show the feeling in the industry against the taxation and will act as a check on further duty. This is not done because the indus-

try is unpatriotic or unwilling to bear its just share of taxation, but simply because the business, with the present prices of materials and existing prices of products, cannot carry the load and necessarily must pass it on to the consumer. It has been felt that the financial executives in charge of Government business in Washington, not understanding the motor car industry, would be inclined to increase this tax another 2 per cent, which manifestly would be overburdening the industry in view of present conditions.

One of the most important matters which was taken up at the meeting was the resolution to curtail railroad shipments of less than 25 miles. This would have the tendency toward increasing motor truck business. In view of the fact, however, that through certain sections of the South it would be impossible on account of road conditions to use trucks, this matter was referred to a special committee for consideration and will come up again.

Christian Girl spoke on the material situation, on the method of securing contracts for Government work and on the way in which the automotive board and the Automobile Industries Committee are handling the work in Washington. These bodies, according to Mr. Girl, will have on hand blue-prints which will cover all the work which the Government requires from the motor car industry. Then, when a factory which is working at 80 per cent capacity needs some other business to fill the other 20 per cent, it will only be necessary to go to this committee as to the work which it will best be able to handle, and this can be done immediately by referring to the blue-prints on hand. This eliminates many round-about steps in getting to the proper authorities and getting an opportunity to see the blue-prints, and by this means the small factory will be taken care of as well as the large.

#### Small Factories Considered

One of the questions brought up at the meeting was on the way in which small factories which are suffering from business depression can make up for their lack of output by Government work, and it was pointed out that many of these factories would not be able to stand the expense of keeping a man in Washington, which Mr. Girl suggested would be the best way of keeping in touch with what is required. This representative in Washington would be enabled to keep constantly in touch with what is required and by so doing would have an opportunity of getting work which is desired for immediate production.

Mr. Girl said that the steel situation need no longer worry anyone. There is more steel in the country than can be used, and in two months many of the steel factories will be begging for business of a structural nature. Regarding shortages in metallic products, the ferro-chrome is the only thing which it is impossible to supply in the quantities demanded. Mr. Girl pointed out that in the spring business it has been found that silico-manganese steels are doing the work of the chrome steels in a satisfactory manner.

On discussing the chrome phase of Mr. Girl's talk, it was decided that the only parts which could not be made, in a small way, to get along without the chrome are

the ball and roller bearings, and a resolution was passed asking that the ball and roller bearing industry be taken care of with what chrome is available, so that existing standards in bearings which affect the entire design of parts should not have to be changed.

Both Mr. Copeland and Mr. Girl said that the coal situation is bad. It is cheaper for the operators to leave the coal in the mines than it is to take it out at the Government prices. If they take it out now they will lose money, but if they do not take it out they will have it at the end of the war and will be able to sell it at a profit. On the other hand, it is hard to get labor, and for a long time no freshly imported labor has been brought over, with the result that the Americanized product declines to work at the wage scale previously given the foreign labor.

Another difficulty with the labor in the coal fields, as pointed out by Mr. Copeland, is that the men will work until they accumulate a small amount of money, such as a month's salary and will lay off until that is spent. It is these two conditions, that of price at the mines and that of the labor situation, which is producing the nation-wide coal shortage.

Mr. Girl stated that one of the big difficulties which factories are up against is due to the unbalanced condition of their inventories. It is, of course, only possible for a factory to build up to the amount taken care of by the lowest member on its stock inventory. A company may have frames and all other parts for 10,000 cars but may only have 250 propeller shafts. A company in this condition would only be able to build 250 cars. The Government, according to Mr. Girl, ought to allow the factories to have an opportunity to balance their inventories, so as to turn the idle stock into cash.

#### PARKER MUST REDUCE STOCK

Detroit, Dec. 14—Clark W. Parker, president of the Parker Rust Proof Co., and W. C. Parker, his son, are ordered by the Michigan securities commission to reduce their stock holdings for patent rights from \$1,059,000 to \$850,000. All but \$300,000 of the \$2,300,000 capitalization is outstanding, and Mr. Parker must give to the company a two-year note for 90,700 at 6 per cent, as alien against the \$850,000 in stock now held by the state. Return stock amounting to about \$200,000 is taken into the company treasury, and an issue of \$100,000 short term note is permitted that the company may continue business.

#### GOODYEAR SEEKS INCREASE

Akron, Ohio, Dec. 17—The Goodyear Tire & Rubber Co. has asked for an increase in its capitalization to \$50,000,000, which would give a total amount of authorized stock of \$100,000,000. At present \$25,000,000 is issued as 7 per cent preferred, and \$25,000,000 common. Of this \$23,750,000 is outstanding preferred and \$20,870,000 is outstanding common, or a total of approximately \$44,000,000. The increase asked to be authorized is half common and half preferred, the preferred to be called the second preferred and issued on a basis of 8 per cent. This latter doubtless will be issued first and possibly not all the stock will be issued now.

## Freight and Coal Worry

### Difficulty in Getting Cars and Fuel Shortage Increase Troubles of Makers

#### Bad Weather Makes Driveaway from Factory Harder

DETROIT, Dec. 14—There are still two clouds on the horizon of the motor-car manufacturers that have become more distinct in the last two weeks. Both are directly due to the freight car situation, one being the difficulty in obtaining cars for the shipment of motor cars to the dealers, combined with the difficulty of making driveaways as in the past due to the weather. The other is the coal shortage situation.

During the last week Reo has held a meeting of several of its distributors to organize a definite driveaway system to overcome the freight car shortage which it is felt will become more pronounced. In fact, fairly authentic rumors have stated that advices have been received from Washington that fewer freight cars will be available after Jan. 1. Other manufacturers are conducting driveaways, Cadillac sending three shifts of three cars each weekly to the Chicago distributor.

The coal situation at present has not become critical. Briscoe reports that it has supplies on hand sufficient to carry it through the winter, and Dodge Brothers, Cadillac, Reo and others have sufficient for immediate needs. It is to be understood, however, in most instances coal is used only for heating purposes, the manufacturers using electric power supplied from a central station.

Ford is perhaps the most hard-pressed of the manufacturers. The daily consumption of the Ford plant is about 900 tons, and less than 1100 tons are on hand at present. About 125 cars of coal consigned to the company are tied up in the Columbus, Ohio, yards, and sixteen others have been hauled from the Toledo yards by the company's crew sent there for that purpose.

The Anderson Electric Co., manufacturers of the Detroit electric, reports a sufficient supply of coal and a noticeable increase in business during the last two weeks. This doubtless is explained by the fact that many electrics are being given as Christmas presents. It is understood that the Anderson Electric Co. has secured substantial contracts from the Government for work of a particularly accurate nature, which this plant is suited to handle.

Dodge Brothers are working on their summer schedule as has been their practice for the last two years. The present output is from 350 to 400 cars a day and it is stated that shipments are being made only to active markets and that the dealers are not allowed to store cars. This has been rendered necessary because the company is behind in its orders and at present has sufficient on hand to keep them busy for a long time. Here, likewise, the big problem is to obtain freight car equipment, and

driveaways are made as far as Oklahoma and Atlanta, Ga. Willys-Overland is running on a schedule of 250 cars a day, and much of its plant is engaged on Government work.

The materials market is somewhat better than it has been. However, sheet metal is introducing several problems in body and fender construction. The method at present being used to offset the shortage is the use of stampings instead of forgings wherever the construction permits the change. It is understood that Chalmers has been assured by its dealers that they will absorb 1000 cars a month during the winter months.

Henry Ford & Son will not be able to meet the order from the English Government for 6000 tractors and 1000 parts on Feb. 1 as scheduled. Munitions work in many factories here is practically ready, and manufacturers are awaiting Government releases on orders which have been given. One local factory will make engines for the Holt type of tractor for ordnance work. Several concerns here are figuring on Liberty engine parts contracts which have not yet been drawn into the business which the Government is querying. The releases on the class A military truck are being awaited, and production will be started in at least three local factories that have been tuning up in preparation for the work. Shortage of gages in factories engaged in munitions work is handicapping some manufacturers and on the class B truck in some instances the gages have been passed from one factory to another.

If the war continues to draw men holding important engineering positions in the factories here to Washington and to different active centers throughout the country such as Dayton in the airplane factories, a shortage in executives is probable. Happily, the recent campaign for skilled mechanics in all departments of the Army has not seriously affected the supply. Many have been taken and many more doubtless will be taken in successive drafts, but most of these were of the draft age, and such would have been taken eventually anyway.

#### PLANTS TO INTERPRET

Detroit, Dec. 14—The factories of this city will furnish from 200 to 250 interpreters and 300 aids to help foreigners answer questions asked in the required draft questionnaire. The interpreters will aid directly the draft boards and the workmen in the factories will spread the information there. It is hoped that this will give a fairer basis for determining the question of necessity to a war industry.

#### OVERLAND HOLDS SALON

Chicago, Dec. 14—Willys-Overland, Inc., is holding its first Chicago salon at the Congress Hotel this week, in which is exhibited a wide variety of standard and custom-built enclosed bodies mounted on the four- and eight-cylinder Willys-Knight chassis. The Willys six with a six-passenger sedan body also is shown.

The complete exhibition comprises ten cars, only one of these being an open car, the eight-cylinder Willys-Knight Varsity, which is a tastily-designed four-passenger



roadster. Among the enclosed cars are two custom-built broughams and two landaulets. The coach work for the former is by Hale & Kilbourne, Philadelphia, Pa., and for the latter by the Blue Ribbon Body Co., Bridgeport, Conn. The standard enclosed types include the limousine, sedan, brougham and coupe. These cars are offered in a variety of color schemes with very complete and elaborate equipment, including dictagraph, interior heater, etc. It originally was intended to exhibit for three days only but due to the large attendance the salon was continued until the end of the week. A similar salon is being held at the Hotel Astor, New York.

#### LONDON STORE AIDS MOTORIST

London, England, Dec. 14—Selfridge & Co., Ltd., the large department store started in London by H. D. Selfridge, who was one time manager of Marshall Field & Co., Chicago, has offered to fill, free of cost, all gas bags carried on motor cars and motor trucks which use fuel gas instead of gasoline for the engine. The Selfridge order, which appears in the form of an advertisement, offers to fill these bags free of cost provided the bag is purchased from its store. The bags contain approximately 250 cu. ft. of gas but vary in size according to the size of the motor car. This department store also is selling gas to fill gas bags not purchased from it, a nominal charge being required.

#### MASON GROSS SALES \$1,200,000

Kent, Ohio, Dec. 14—Gross sales by the Mason Tire & Rubber Co. for the year ending Oct. 31 were \$1,200,000, and the total net profits amounted to \$181,504.36. Deductions for income tax reserve, preferred stock dividends during 1917 and preferred dividend reserve leave a surplus of \$104,330.22, within a fraction of 20 per cent on the common stock.

## Shows 'Bigger Than Ever'

### New York and Chicago to Have More Individual Exhibits Than Last Year

#### To Display Ninety Cars at Astor Salon This Year

NEW YORK, Dec. 17—Advance reports on the national show here Jan. 5-12 indicate more individual exhibits of cars, accessories and parts than ever before, and many products will be shown for the first time. In all there will be eighty-six different makes of cars and 260 accessory displays here and at Chicago, Jan. 26-Feb. 2, also. Applications for space from late comers have been turned down for lack of space, though under the present space arrangements a little more room is available than last year. A range of more than 300 cars, varying from the runabout for a few hundred dollars to the largest limousines costing more than \$5,000, will be exhibited. Among the displays will be makes of electric and steam cars also.

In comparing the prices of cars to be exhibited, it is found that whereas last year about 10 per cent of the models sold for less than \$750, this year just under 6 per cent of the models will sell under this price. Increased cost of material and labor has changed car statistics to such an extent that only 21.6 per cent of the 1918 models will list for less than \$1,000. Last year this price class represented 27.7 per cent. One wishing to spend between \$1,000 and \$2,000 for a car this year will have 49 per cent of the models on the market from which to select, while last year it would have been 53.6 per cent. Among the cars selling for more than \$2,000 the percentage has increased from 18.7 to 29.4.

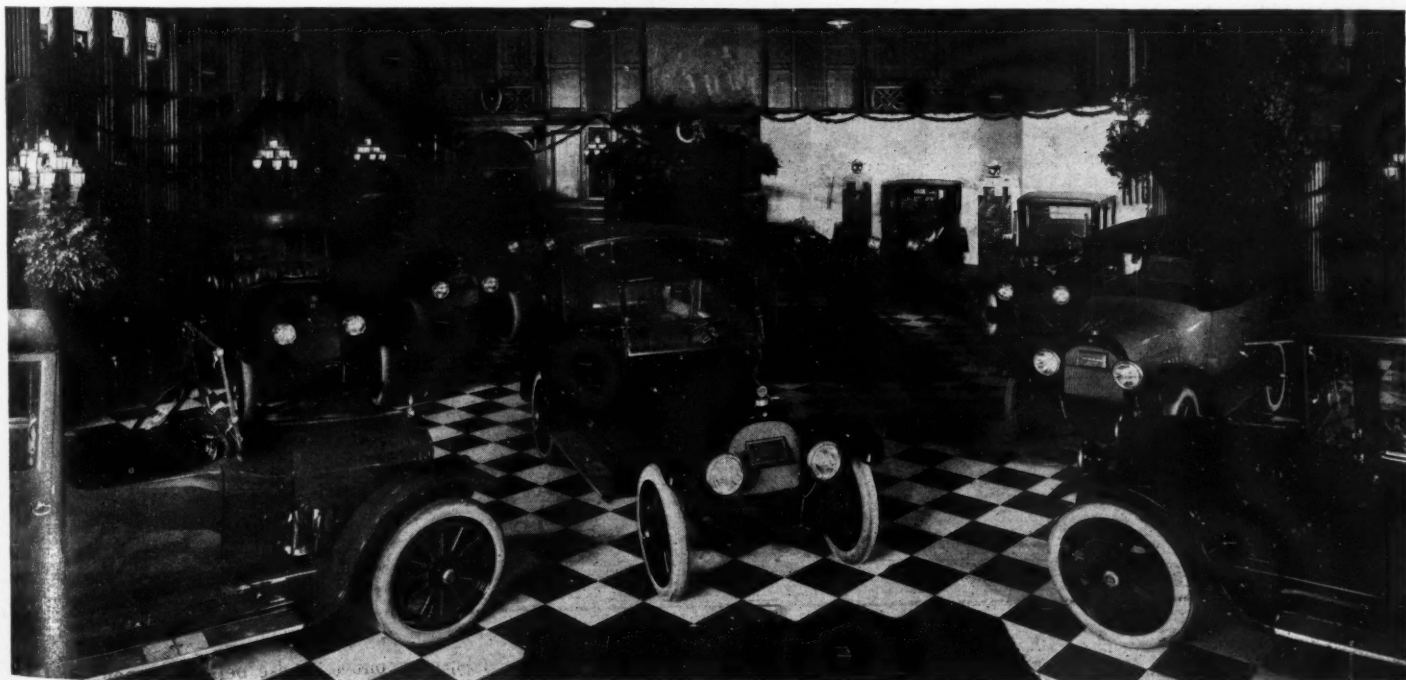
All of the exhibition space on the main

floor and in the balcony of the Astor ballroom is taken for the salon which opens Jan. 2. A dozen makes of American cars are represented, and altogether there will be about ninety cars on display, worth in the aggregate half a million dollars. The makes of cars to be shown at the New York salon include Biddle, Brewster, Cunningham, Daniels, Fageol, Fergus, Lancia, Locomobile, Murray, Mercury, Rolls-Royce, Simplex, White and Wolverine. Separate custom coachwork exhibits will be made by Brooks-Ostruk and Rubay. Accessory displays include Dunlap and Faure tires, Westinghouse air spring, Macbeth lens, Stentorphone, Fryer-Auster shield, Laidlaw cloths and Duratex.

#### TRUCK MAIL ROUTE PLANNED

Detroit, Dec. 17—A motor mail service between Detroit and Toledo has been proposed by the Washington authorities, and the postoffice department of this city has been asked to supply data showing whether such a plan would be feasible. This route would serve the citizens of small towns on the route as well as the farmers with stamps, money orders and mail delivery and collection. A proposed mail route would include River Rouge, Ecorse, Wyandotte, Trenton, Rockwood and Monroe, and trips would be made daily. According to the schedule sent from Washington, the truck would leave Toledo at 6 a. m. and arrive at Detroit at 12 noon; leave Detroit at 1 p. m., and arrive at Toledo at 7 p. m. The distance is 59.3 miles.

Bids are being called for, stating that the above conditions are to be filled. The term of the contract runs from Feb. 1, 1918, to June 30, 1919, and the one securing the contract must go under \$10,000 bond. In the contract it is stated that the purpose of the route is to bring better prices to the producer, and lower the prices to the consumer. William J. Nagel, Detroit postmaster, has been asked to determine the productivity of the territory.



In the Elizabethan room at the Congress Hotel in Chicago during the Willys-Overland salon

# Fitting the Radiator with Hood

Covers That Roll Up and Down to Suit  
Needs of Various Cooling Systems on Cars

**N**ATURALLY enough if you are going to use your car day in and day out this winter you will fit a radiator and hood cover. When selecting these, especially the radiator cover, pay particular attention to the flap to see that it is of generous dimensions to allow the cooling area to be graduated according to the weather. Also see that the flap rolls up far enough to permit cooling the top part of the radiator. Many owners do not realize in equipping their cars with covers to what extent the cooling capacity of the radiator is reduced.

The average radiator hood when the flap is rolled up covers anywhere from 45 to 60 per cent of the total cooling surface of the radiator. And the flap when rolled up, in some instances, covers the hottest part of the radiator, which needs the most cooling and leaves exposed the coolest part, where there is little or no flow of water. This, of course, applies to cars with thermo-syphon cooling. Inasmuch as hot water always flows upward, the top part, or that above the space exposed when the flap is up, will be hottest. This is why you should be careful to select a cover that will roll up as far as possible. The dangers of overheating from this cause is greater in the late fall or spring of the year than in mid-winter, owing to sudden temperature changes. There are some radiator covers so arranged that the flap rolls down, thereby insuring the cooling of the hottest area. If your engine overheats too easily with a cover of the conventional type, it would be well to fit one that has the flap arranged in this fashion. Following are descriptions of various makes of radiator covers, from which car owners should be able to make a suitable choice to meet their particular needs.

## Robe in Two Parts

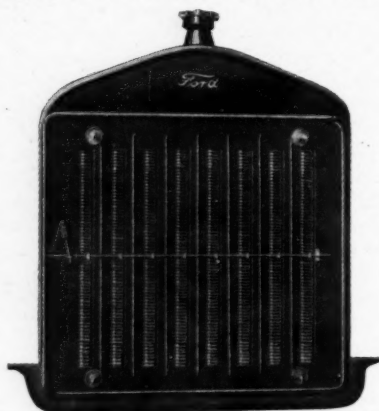
**Gordon**—The Jack Frost robe is made in two parts, a jacket with curtain that completely covers the radiator and a robe to cover the hood. It is just as easy to raise the hood with the robe on as without it. Secure and convenient fastenings hold both parts in position so they cannot be blown off or worked loose by vibration. The Gordon is so made that the curtain over the front of the radiator may be adjusted to weather conditions and closed entirely when the engine is not running, to keep the latter warm.

The better grade is artificial leather and the cheaper one a special enameled cloth. Both are lined with a heavy heat-retaining material. The Gordon company manufactures these robes in the divided curtain style and also in a one-piece curtain for Fords. The latter rolls from the bottom up and thus in no way interferes with cranking the engine. Gordon covers are made to fit every American car and if desired only the radiator cover can be purchased, which, however, leaves the hood exposed. Prices range from \$1.80 for the

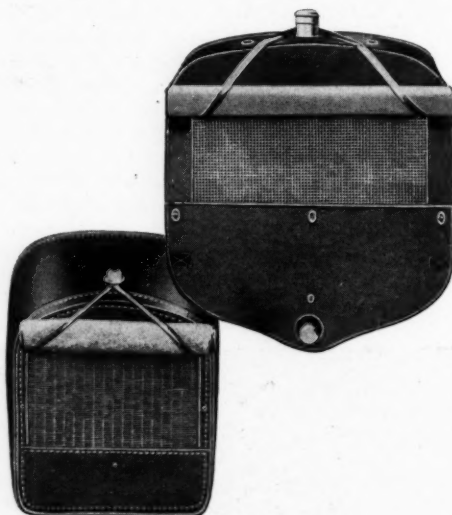
By B. M. Ikert

Motor Age Editorial Staff

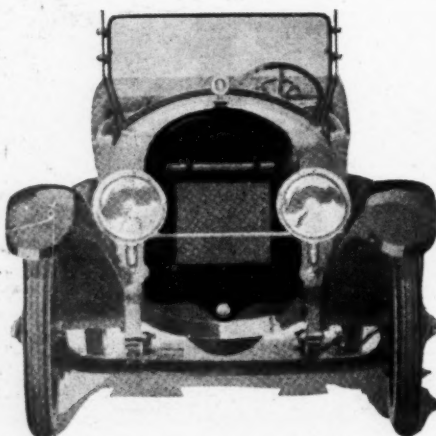
Ford radiator cover to \$18, which is the price of a hood and radiator cover for cars like the Pierce-Arrow and Winton, being made of artificial leather. For the



H-M cover of adjustable metal shutters



Gordon robes, made for any American car



Phillips cover, showing one for Marmon

Dodge Brothers, Chevrolet and Buick a complete set of radiator and hood covers in enameled cloth costs \$6. The same in artificial leather costs \$12. A Ford radiator and hood cover in artificial leather costs \$8.50.—J. P. Gordon Co., Columbus, Ohio.

**Nathan**—Nathan radiator and hood covers protect both the radiator and hood from frost. The curtain in front is so arranged that it opens from the top down, affording protection where most needed. The hood robe is easily detached and radiator cover used separately. It is so arranged that hood may be raised on either side without removing. Nathan covers are made in fabric leather, substantially lined with felt, which retains the heat for a long period, it is said. They are made in a number of styles to fit practically all of the popular makes of cars. There is one, for instance, which is meant for the Ford radiator and sells for \$1.40 in artificial leather, while the same in fabric leather is priced at \$2.10. The combination hood and radiator covers for 1917 Fords in fabric leather sells for \$6, while for earlier models the price is \$5.50.

There is also a combination hood and radiator cover in artificial leather and lined with felt for Dodge Brothers, Maxwell, Overland, Chevrolet, Buick and Saxon which sells for \$6. The same can be had in fabric leather, a better grade, for \$7.50.—Nathan Novelty Mfg. Co., New York.

**Atlas**—These covers are made in two pieces and during mild weather the hood cover can be removed without interfering with the radiator cover. They are made of fabric leather with heavy kersey lining or in artificial leather with kersey lining. There is a two-piece curtain, the lower section of which unrolls up halfway; the other section rolls down and overlaps the lower section at the center. The lower part of the radiator cover is reinforced with leather. These covers for straight front radiators in imitation leather cost \$3.75; in fabric leather, \$4.75. The price for V-type radiator covers is \$1.25 additional. The combined hood and radiator



Frost-King radiator and engine cover



covers sell for \$10.75 in fabric leather, and \$8 in artificial leather. There are also covers for Fords in both radiator and hood styles. These can be had singly or in combination. The radiator covers vary in price from \$1.50 to \$2, while the price of the hood covers is from \$1.75 to \$2.60. The latter are attached by four clips. Combination radiator and hood covers for Fords in artificial leather are variously priced from \$2.85 to \$4.75, depending on the model of car and the quality of material in the covers.—Atlas Specialty Mfg. Co., Chicago.

Phillips—These radiator covers are made after the conventional pattern and come in various sizes to fit most any make of car. The one in the illustration, for example, is fitted on a Marmon car. The Phillips cover has the flap arranged to roll up from the bottom, suitable fasteners being provided to hold the flap in place when it is down. Prices of the Phillips radiator covers range from \$4 to \$8, according to the size of the car. This company also makes hood covers which can be buttoned to the radiator cover. The hood covers cost from \$3.50 to \$6 extra.—Phillips Auto Seat Cover Co., New York.

Bemco—Like most radiator covers, the Bemco is made for all makes of cars and has as a particular feature cross pieces of the same material as used in the cover, which tend to keep the front of the cover perfectly smooth when in position. They are made of fabric leather and lined with heavy felt. Without the hood cover the price is \$5.80 for all cars excepting Fords. With hood cover, which can be readily detached, the price is \$10.50.

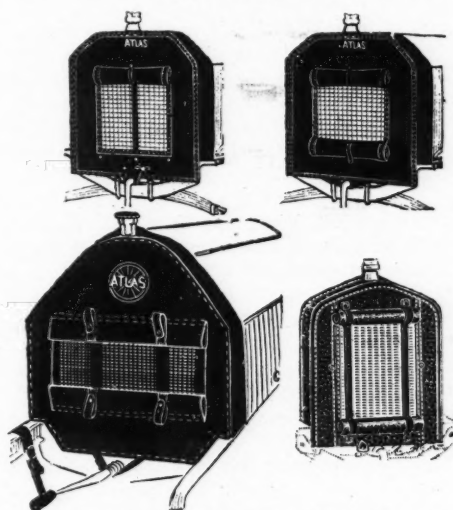
For Fords the company makes a combined radiator and hood cover of enameled drill, felt lined, for \$2.65 for 1917 models and \$2.40 for previous models. In fabric leather, the prices are \$5.50 and \$5, respectively. The Ford radiator cover alone is priced at \$2.15 for fabric leather and \$1.30 in enameled drill. Bull-nosed and V-shaped covers are furnished at \$1.25 extra.—B. & E. Mfg. Co., 18-22 West Eighth Street, New York.

Neptune—The Neptune radiator and hood cover is built on scientific principles, having an air-filled space confined between two stout fabrics, which are both wind- and water-proof. The shutter or flap rolls down and the roll at the bottom does not interfere with the license plate when it is attached to the filler neck of radiator. The shutter rolls at the top in all Ford models, to avoid interference with the crank. The hood and radiator cover are flannel-lined to prevent scratching the varnish. It re-

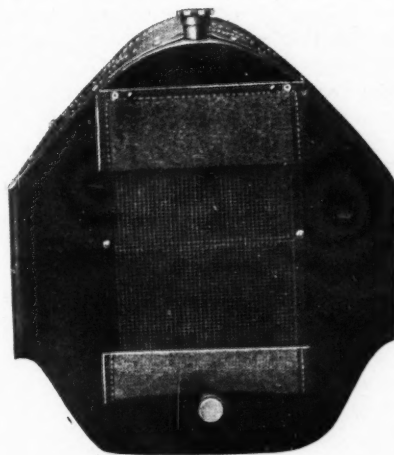
quires about 1 min. to place it on the car. Neptune covers are made to measure and it is necessary to give the name of car and model, when ordering. Price for Fords is \$10. For other cars, the price is \$12.—Clinton Ladow, Asbury Park, N. J.

Premier—These covers are made of heavy water-proofed material, lined with wool cloth, in assorted shades. They are provided with extra fasteners to hold cover in place. The price of these covers for radiator only on Overland, Cadillac, Buick, Hupmobile, Studebaker, Maxwell and Saxon is \$3. For Packard and Peerless, the price is \$3.50. The hood covers for all cars excepting the last two named is \$5.50.

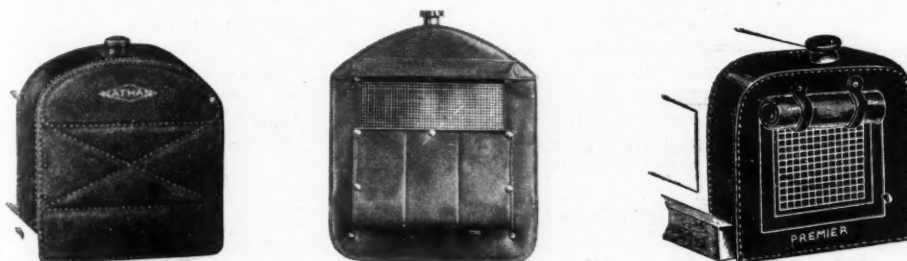
This company also has a number of styles for Ford cars. The model 180X is made of black drill and lined with gray felt. It sells for 96 cents, while the same



Atlas covers, which are in two pieces



One of the Wisconsin radiator covers



The Nathan, left; Allen, center, and Premier covers for radiators

in heavy black duck sells for \$1.25. The above are for the radiator only. There is a combined radiator and hood cover for Fords which sells for \$1.94 in drill, \$2.46 in black duck and \$4.92 in heavy leather material lined with wool. All of these covers have leather reinforcements for the openings around the cap and sides for the handles to go through.—Premier Auto Novelty Mfg. Co., 375 West Broadway, New York.

#### Center of Asbestos

Frost-King—This radiator and engine cover is made of three-ply material with asbestos center. The outside is imitation leather and the inside kersey blanketing material. The Frost-King covers, owing to their quilted construction, are handsome, as well as serviceable. The front flap rolls up and there is a slip loop for holding it in position. The company has patterns to fit nearly every car made, particularly the late models. The price of a radiator and hood cover for the Allen, Chalmers, Overland, Paige, etc., is \$7.50. The radiator cover alone is \$3.25. For the Marmon, Mitchell, Velie, etc., the combination sells for \$8. For Packard, Premier, Moline-Knight, etc., the price is \$10. The price of the Ford outfit is \$4.25, for the 1917 model and \$3.90 for previous years. Such cars as Buick, Dodge, Maxwell, etc., can be equipped with hood and radiator cover for \$6.25.

There is also the Artic radiator and engine cover built for Fords only. It is made of imitation leather, backed with heavy kersey material. Radiator and hood cover complete for 1917 Fords is \$3.75. For earlier models the price is \$3.50.—Cincinnati Auto Specialty Co., Cincinnati, Ohio.

Wisconsin—These hood and radiator covers are made in two brands, the Badger and Watco, the former being heavier material and generally better constructed. It is made of Neverleek, the same material as used in tops. The Watco covers are cheaper and made of heavy weight kersey cloth combined with a good grade of enamel cloth. Both styles are made up to fit practically all cars and can be had in the radiator cover only or in combination with a hood cover. The latter are so made that the hood can be raised without interference. The price of a hood and radiator cover in the Badger brand for cars like Apperson, Crow-Elkhart, Case, etc., is \$13.80, while for the same cars, the Watco brand covers sell for \$7.80. The most expensive covers are those for cars like Winton, Pierce-Arrow, etc., which cost \$15.30 in the better material and \$9.30 in the Watco style. For Fords the company makes suitable covers in both styles as follows: In the Watco, radiator cover alone, \$1.60; radiator and hood cover, \$3.30; Badger, radiator cover alone, \$3.70; combination, \$7.30.—Wisconsin Auto Top Co., Racine, Wis.

#### Covers to Order

Allen—Allen radiator covers are made to order, of fabric leather, fully lined with a good quality of rope plush. The outside is imitation leather, but covers can also be had in enameled duck in various colors. The flap of the Allen cover

(Concluded on page 27)

# U. S. A. Adds Class AA Truck

## Quartermaster Corps Completes Standardization of $\frac{3}{4}$ -Ton Bevel Drive Model for Use by Many of the Government Departments

THE biggest thing yet done in the standardization of motor trucks for war purposes has just been accomplished by the completion of the design for the new class AA truck, a  $\frac{3}{4}$ -ton, bevel-drive vehicle which is the acme of motor truck standardization because it is adapted not only to the uses of the quartermaster corps, by which it was designed, but also to the work of the Navy, marine corps, ordnance corps, bureau of docks, signal corps, medical corps and for cantonment work in addition to any other Government work requiring a  $\frac{3}{4}$ -ton vehicle and even for an officer's car with a passenger body. The new truck takes on added importance when it is considered that it will be used for peace as well as war work in that it will be employed for postoffice work during the coming year and all the trucks emerging from war service will be put into that service at a later date. It marks a great step forward toward the standardized design of trucks owned by the Government in all branches of non-war work.

### To Assemble Five Now

Five of the new jobs will be assembled as test vehicles at once, the parts for the vehicles having already been ordered. It is expected that all the first four experimental models will be completed and running under their own power by Jan. 15, 1918. The latter vehicles will be assembled by the Reo Motor Car Co., Lansing, Mich.; the Federal Motor Truck Co., Detroit; the Maxwell Motor Car Co., Detroit; and Willys-Overland, Inc., Toledo. The fifth truck will be assembled later in Washington, as a test against the quartermasters' corps drawings.

The number of these trucks to be ordered is still very indefinite, although it is possible that 3500 will be needed as ambulances by the medical corps; another 1000 at least by the ordnance corps and 5000 or more by the signal corps and a large number by the quartermaster corps.

As soon as the test vehicles are completed they will be tested out in the same manner as has been the class B truck of the quartermaster corps and orders for assembly then placed in large numbers.

The engine of the new vehicle already is completed. It was finished in the remarkably short time of fourteen days, which compares very favorably with the time taken to turn out the engines for the heavy-and-light-duty class B and A war trucks. It was made by the Northway Motor Corp., Detroit. The latter concern received its order to turn out the engine on Nov. 26, and fourteen days later the engine was on the block being tested, notwithstanding the dies for the crankshaft and the patterns for other parts had to be turned out in that short period of time. Other parts now ordered and being turned out as fast as possible include the three-

speed gearset being made by the Grant-Lees Co.; steering column by the Gemmer Mfg. Co.; the control lever set by the Warner Gear Co.; pressed steel frame by the Detroit Pressed Steel Co.; springs by the Detroit Steel Products Co.; the radiator core by the Long Mfg. Co., Detroit, and the pressed steel top and bottom tanks by the Federal Motor Truck Co., Detroit; wooden wheels by the Prudden Wheel Co., and two sets of steel disk wheels, to be tested later, by the Detroit Pressed Steel Co. and the Indestructible Co. All wheels will be fitted with Baker rims, carrying 35 by 5 cord tires, equivalent to 36 by  $5\frac{1}{2}$  ordinary pneumatics. The rear axle of the truck is being turned out by the American Ball Bearing Co.

In design there are many parts of the new class AA job which follow the class A light-duty war trucks assembled by the Autocar, Denby and White companies. For instance, the engine is designed somewhat along the same lines as the class A and B truck units and has the same hot-spot manifold idea. Again, there will be two separate sets of ignition apparatus with two sets of spark plugs and a generator of the same type as used on the A and B trucks. The rear universal joints will be as on the class B truck. Again, the steering column and wheel will be the same as on the class A job and will have the same type of spark and throttle control. The electrical equipment and the engine oiling system will follow closely the design of the class B trucks.

The new truck will differ from the other standardized models in that it will be bevel-driven, fitted with an electric starter; have a vertical finned tube radiator with a pressed steel casing instead of cast steel with cooling fins; have its two electric headlights attached to the side members of the radiator instead of on the dash and will have a speedometer driven off the gearset. It also will be equipped with a special Kellogg air pump driven off the gearset for inflating the pneumatic tires without having to run to some garage or repair station.

### Accessibility in Design

The greatest feature of the truck, outside of its many uses, is the accessibility of the design. Every part has been made as easy to get at as possible and many pressings have been employed to reduce the weight to as low as is consistent with good practice. The frame is of pressed steel with four crossmembers; the radiator tanks are of pressed steel as are also the dash, cowl, running board, fenders, fuel tanks and torque arm.

The power transmission is from the engine through a Thermoid fabric universal joint to the three-speed gearset mounted amidships and thence through a short propeller shaft with two metal universal joints

to the bevel-driven rear axle. The clutch and gearset can be removed without affecting the engine or steering gear or column.

Brief specifications of the truck are as follows: Wheelbase, 130 in.; tread, 56 in.; turning radius,  $21\frac{1}{2}$  ft.; wheels, 36 in., wood and steel, the former with twelve spokes in the fronts of  $1\frac{1}{4}$  in. diameter, and 2 in. diameter in the rears, and the metal wheels of the disk type; frame, pressed steel, straight sided, with rails  $4\frac{1}{8}$  in. deep, top and bottom flanges  $1\frac{3}{4}$  in. wide all of  $\frac{3}{8}$  in. stock; overall length of the frame, 179 in., which allows sufficient space for fitting the various types of bodies as employed by the different departments. The assumed weight of the truck, including the chassis with all tanks filled, express body, driver and helper and a normal load of 1500 lb. is 5600 lb. When uniformly loaded, the assumed weight in front is 2240 lb., and in the rear 3360. Unloaded, the weight distribution is 2100 lb. in front and 2000 lb. in the rear. The radiator core is of the vertical tube type with a thickness not to exceed  $3\frac{1}{2}$  in. and to have provision for attaching shutters. It will have a 16-in. fan driven by a  $1\frac{1}{2}$ -in. belt running on a ball-bearing hub.

### 4 by 5 Engine

The engine will be 4 by 5, with a displacement of 251.3 cu. in. Its weight is not to exceed 525 lb. The crank diameter is  $2\frac{1}{8}$  in., with the same sized pins and bearings. The assumed maximum torque was to be at 1800 r.p.m. and the first block test of the engine showed a level torque curve at between 800 and 1500 r.p.m. with a maximum horsepower of 38.5 at 2200 r.p.m. It is expected that this horsepower will be increased to over 42 at same speed after the pistons and other moving parts have been worn in to a greater extent. The maximum speed of the truck is to be about 30 m.p.h. with the governor disconnected, although the latter may be set to give any desired speed. The overall length of the engine from the fan to the rear of the cylinder block is to be 31 in. The flywheel is 16 in. in diameter and is to weigh not over 80 lb. and to have a detachable steel starting gear. The engine crankcase is to be of aluminum with a No. 3 bell housing, with supporting arms in rear and a trunnion in front. Furthermore, the crankcase is so designed that cylinders of  $3\frac{3}{4}$  bore by 5 in. stroke are interchangeable. The gearset is of the three-speed type with center control, and with gears of  $\frac{7}{8}$ -in. face and 6 to 8 pitch stub teeth. The gearshift lever is located directly in gearset cover and brake lever and ratchet on cover. The reverse idler gear is on the left side looking from the rear. The tentative rear ratios are direct on high; 1.76 to 1 on intermediate; 4.01 to 1 on low and 4.93 to 1 on reverse. The gearset has an oil-filling



hole at the front end to permit of filling by removing the floor boards.

The front axle is of the I-beam section with Elliott type fore and aft steer with the column on the left. Spring clip bolts are  $\frac{5}{8}$  in. in diameter and the spring centers are  $28\frac{1}{4}$  in. The drag link is of 1-in. tube stock.

The rear axle is of the bevel spiral type with sixty-one teeth in ring gear, giving a normal ratio of 5.5 to 1 with an eleven-tooth pinion of  $4\frac{3}{4}$  in. pitch. The weight of the rear axle is set at 325 lb. with a pressed steel axle housing without truss rods and with alloy steel tubes for carrying the outer bearings. The clearing under the gear housing will be 10 in. with 35-in. wheels.

The torque will be taken through a channel-section torque arm with lightening holes in the center. The feature of this arm is that it is carried on a spring at the point of attachment to the bracket fastened to the frame in much the same manner as employed on the Reo 1500-lb. delivery car. This is to reduce the rattle and wear. The driving propulsion will be taken through radius rods.

#### Three Bodies Ordered

To get the truck to work immediately the chassis is completed, the quartermaster corps already has placed orders for three Q. M. C. bodies with the C. R. Wilson Co., Detroit, the Otto Body Co., Lansing, Mich., and the Budd Mfg. Co., Philadelphia, Pa. The body of the latter concern is to be of metal. In each case the type follows the design of the previous Q. M. C. units with bow tops and tarpaulin covers. The wood types are reinforced with pressed steel brackets on the outside and are provided with folding seats to carry twelve persons. These seats can fold back over the flare-boards on each side with the supports folding up against the inside. Bodies for the signal corps and the medical corps already are being worked out to suit their own particular needs. When used as an ambulance by the medical corps, the class AA truck will be fitted with special springs to make for easier riding.

#### BOOK FOR AVIATORS

Washington, Dec. 14—The Weather Bureau handbook for the use of aeronauts can be obtained through application made to the National Advisory Committee for Aeronautics, Washington, D. C. The handbook discusses the properties and general phenomena of the atmosphere which aeronauts and aviators should understand.

#### FRANKLIN DRIVES AWAY CARS

Syracuse, N. Y., Dec. 14—The Franklin Automobile Co. is driving cars away to all eastern and central points whenever possible. In the last four months 530 cars have been driven away by dealers, this representing 15.7 per cent of the total shipments. The August percentage was 21.8; September, 14.2 per cent; October, 12.1 per cent; and November, 10 per cent. Dealers in Baltimore, Washington, New York, Philadelphia, Boston, Cleveland, Detroit and Cincinnati are receiving most of their cars by this method, and driveaways have been made to Portland, Me., Norfolk, Va., Montreal, Can., Paducah, Ky., Kansas City, Mo., Des Moines, Iowa, and San Diego, Cal.

## '17 Park Motors Double Increase in Number of Private Cars Entering National Play- grounds 100 Per Cent

### Free Camps and Extra Guard Pre- cautions Featured

	1916	1917
Yellowstone .....	3,445	5,703
Casa Grande Ruin.....	470	604
Sequoia .....	736	2,334
Yosemite .....	4,043	6,521
General Grant .....	1,778	2,158
Mount Ranier .....	3,070	5,894
Crater Lake .....	2,649	2,756
Wind Cave .....	2,500	4,837
Mesa Verde .....	185	364
Glacier .....	902	1,121
Rocky Mountain .....	10,050	23,004
Total .....	29,828	55,296

OUR national parks are coming into their own. Let but another season swing its round, and their permanent hold on the affections of motorists and the public at large will be assured. A glance at the figures for 1916 and 1917, given here, tells not half the story. The road improvements, the increase in free camping facilities, the opening of new sections, all have their part in the new record made this year.

An increase of almost 100 per cent in the number of private motor cars entering the parks, 55,296 in 1917 as compared to 29,828 in 1916, is indicated. And these are in addition to the public traffic in the Yellowstone, where motor buses superseded the old stage coaches.

During the 1917 season motoring between the parks was with less difficulty than ever before. There is still need for work in marking the routes on the park-to-park highway, but much progress has been made in the last two years. In this connection, the National Parks Highway Association and the National Park-to-Park Highway Association are due much of the credit for mapping and sign-posting the routes. Many motoring parties motored through several of the parks. One party motored through nine national parks and several monuments during the summer. Motoring in the parks themselves was improved. Every effort was made to safeguard motor travel. Traffic rangers were assigned to regulate heavy traffic, and all traffic on dangerous curves was closely checked. Free motor camp service in several of the parks was given.

The result of the increased motor travel was evident in the revenue, though in every park the fee charged had been reduced. The parks collected \$87,574 from cars and motorcycles together. This is compared to \$65,833.50 in 1916.

#### MOORE ON EXHIBIT

Washington, Dec. 12—Special telegram—The two-wheeled car made by the Moore Car Co. is on exhibition here and displays many radical features combining some of motorcycle, some of the motor car. The car known both by above title and as

Moore car resembles slightly the popular makes of motorcycles but in construction follows practices of the motor car in that it has unit powerplant of motor car type, with three speed selective gear transmission, shaft drive with spiral bevel gear at rear, steering grip with inclosed control, 36-in. semi-elliptic spring suspension and comfortable upholstered bucket seat, internal expanding brake, comfortable footboards and a pressed steel chassis of typical motor car make. The powerplant transmission, magneto and operating levers are in unit suspended in motor car fashion. Various openings shown in stripped chassis afford ample access for adjustment. Small wheels on either side provide wide and convenient stand for rest and makes it possible for driver to start engine, take place in seat and get away with his feet on the footboards.

The steering mechanism is so arranged as to allow the necessary inclined steering axis on the front wheel and yet have the usual side rails of the motor car. The general specifications include two-cylinder internal air-cooled 22-hp. engine, high-tension magneto with separate generator, three-speed selective gear transmissions and unit powerplant, motor car type, shaft drive with spiral bevel at rear, electric lights and horn, lights controlled at dash, steering grip control all inclosed, disappearing rear seat, wheelbase of  $61\frac{1}{2}$  in., 28 by 3 tires, internal expanding brake, 19-in. steering head at center of loads, pressed steel chassis, motor car construction throughout. Gear ratios are  $3\frac{1}{2}$  to 1, 5 to 1 and 7 to 1. Speed varies 3 to 90 miles per hour.

#### HOW CANADA RENTS TRACTORS

Montreal, Ont., Dec. 14—Ontario has a deep interest in the development of the farm tractor, as it is believed that motorized equipment for the farm will improve the solution of farm labor difficulties in the province. According to the announcement by C. F. Bailey, assistant deputy minister of agriculture for Ontario, this province now owns ninety-five farm tractors which are engaged in plowing in many districts. The government charges the farmer 45 cents an hour, the farmer also to pay for gasoline and oil and the board of the tractor operator. The government pays the wages of all "tractioners." In case of rain, the farmer continues to board the operator of the tractor which he has hired from the government until required work is done.

#### CAR OWNERS CARRY COAL

Louisville, Ky., Dec. 15—The well-known antipathy of the negro for snow and his refusal to work when he has meal and bacon enough to satisfy his appetite is in the main responsible, according to retail coal dealers, for the inability of householders in Louisville to get coal delivered during the coldest weather Louisville has experienced since the establishment of the local weather bureau. It is a common sight to see car owners drive up to coal yards and carry home on the floors and seats of their tonneaus as many bushel baskets and bags of coal as they can crowd into the limited space. All kinds of privately-owned vehicles are being utilized.

# Future of Commercial Aircraft

## Possibilities of Plane and Truck in War and Business Discussed from Various Angles

**C**HICAGO, Dec. 15—The fundamentals of plane design and the future commercial possibilities of aircraft after the war, and the essential difference between motor trucks for war and commercial service were the features of papers presented by W. B. Stout, technical advisor to the Aircraft Board, and G. W. Smith, assistant chief engineer of Nash Motor Co. to the Mid-West section of the Society of Automotive Engineers last evening. Lieut. W. G. Hamilton of the Canadian Black Watch also gave an interesting talk regarding his experience on the western battle front in France.

W. B. Stout's paper "The Commercial Future of Aircraft," in part, is as follows:

### Future of Aircraft

Before attempting to describe the changes that will come about it will be necessary to establish some fundamentals regarding the work we are to do; all problems in their first analysis involving two lines of thought. First we must find what to do; then discover how to do it. So first, what must we consider in the problem of commercial aircraft, in the line of what to do?

First, our public must be made safe. Second, it must be made comfortable. Third, it must be transported from one place to another with advantage over other means of travel either in speed, lower cost, or comfort. Fourth, it must be given a mental attitude of receptiveness toward the new transportation.

As in the early days of the motor car, safety is the first thought of the public in relation to the new air transportation, and hence must be considered first for commercial work where, as I have said before, the public, and not the war lords, are the final dictators on design.

The things that bring safety in aircraft are many, and will take development. When they all are available air travel will be safer per mile and passenger than any other form of travel. I say this with conviction, and believe analysis will bear me out. Not all of the safety factors have to do with the machine or engineering as we know it. I will touch on the engineering factors first, however.

Ninety per cent of the danger in present-day flying, as shown by statistics, is in the landing. There are almost no failures of parts in the air since we have found the weaknesses and faulty figuring of the early days, when to fly at all was equivalent to joining the suicide club. The entire danger, as Darius Green pointed out long ago, is in the landing. This, then, should come in for extended study, that there be a minimum of danger during this small period of time.

### Three Major Causes

This danger is tied up in three major things: the speed of the plane when it lands, the roughness of the ground, and the required space within which the machine may easily be landed and brought to a stop.

The first item of landing speed is a direct function of the design of the plane, and so at this point may I be allowed to digress a little and discuss some of the fundamentals of plane design that relate to range of performance?

An airplane is nothing more than a kite of scientific form. For a certain pull on the kite string—known as drift—one can make the kite lift a certain weight of tail papers, the weight depending on the lift of the kite surfaces. The

best kite is the one that will give the most lift with the least kite-string-pull; and likewise the best wing curve is one that will give the most lift with the least drift.

For the steep angle of flight the deeply curved wing is the proper thing. This curve means lift, and for bombers and heavy lifting planes deeply curved aerofoils are used, but they are not suitable for speed. When one crowds on power to make them fast, or attempts speed by cutting down surface the condition at the flat angle of incidence which the plane takes at high speeds, banking up in front of the wing in eddies like a bow wave in front of a canal boat, and no amount of power could even make a speed yacht out of an Erie freighter. The wing curve is a "freighter" curve.

On the other hand, a speed boat is unsuited for freight uses, but is shaped to offer the least resistance to the water as it slips through with as little burden as possible. Here is a wing that slides through the air at flat angles with little resistance and no bow wave, but its lift per square foot is low. The deep curved wing may lift 10 lb. a square foot, and the speed curve not more than 5. Here, however, is where the plane beats the boat, for we can add surface in the wings with the low lift curve until our maximum lift equals that we had with less surface with the high lift curve, and by crowding on power get high speed, while we still retain our old original slow landing speed. It is by this method that planes have been perfected getting off the ground at around 45 m.p.h. and flying up to 125.

Thus when speed is necessary, as it will be for commercial work, we can add surface and use stream line curves and get the very necessary speed range. This is not all, however. The wing that has the greatest lift with the least drift—or resistance to forward travel—is all things considered the most efficient wing. This drift is in lifting planes a large factor of power consumption, but it forms only a fraction of the head-on resistance to forward flight known as head resistance.

Head resistance is of two kinds: drift, which is useful, and parasite resistance, which is useless.

The resistance of the wings to progress is necessary to get lift. Overcoming this resistance allows our plane to fly. The resistance of the plane body, however, the wires, and struts and all exposed parts, is only lost work and does not contribute to supporting the plane. At 60-mile speeds the parasite parts are not of major importance; at speeds of over a hundred they are the dominant hindrance.

When one wants speed one must decrease the parasite parts exposed to an absolute minimum, that the greater part of his power may be spent in useful work.

I have discussed this much of air principles to show the ways which have been followed and which can be followed to get the high speeds in the air and yet get the low landing speeds which we desire, and yet, because of some of these things, you will see why landing speed alone does not solve the safety item.

With this large surface plane we have a light wing loading, so that when the power is shut off it "floats" for a long distance. Thus when you come over the trees to land in a small field you will float for some distance before you can get to earth for landing. If you dive to get to the ground quickly you pick up speed quickly, and when you get to the ground over the trees find yourself at high speed. What, then, is the use of slow speed landing if it takes twice the space to land with a floater machine. After

you touch the ground, too, this machine takes a long time to stop. Machines of heavy loading and fast landing are able to land in ball parks. The pilot is in danger, however, at the time he touches the ground at speed, but the machine quickly slows down. In the end one type is about as dangerous as the other, for for safety a machine must be able to do three things, as we have said: land at the slowest possible speed, in the smallest possible space, and on the roughest possible ground. We can land at slow speed, and in small space, but not with the same machine. The third item may give a clue to further study, that of landing on rough ground. Present machines have high landing gears, demanded by the necessary propeller clearance at the front of the machine. The whole machine, for this reason lands, as one might say, on stilts, and if one stubs his toe when on stilts he is very likely to go over and has a long way to fall. The center of weight in planes is high, and when the wheels strike really rough ground the action of the wind on the tail surfaces is the only means of keeping the machine from somersaulting; and this pressure gets less and less as the plane slows down.

### Safety in Landing

For safety in landing means should be devised for carrying the weight low without interfering with the flying qualities of the plane—and this is a real problem. If the weight could be low, and the body as near to the ground when one lands as a motor car body, then the danger of nosing over would be small, and a high speed landing could be made in small space on rough ground in safety, which is the big item. This allowing higher landing speed with safety would allow designers to increase maximum air speed so that there would be benefit all around. By solving the last two items of our landing problem we have been able to forget the first—that of slowest speed landing. All engineering is a compromise, of course, but here is a rational eventuality for landing safety.

The commercial plane may go a step further than I have indicated—and here is real opportunity for you inventors—by developing planes with variable wing curves. Then we can get off the ground with a deep curved lifting wing for climbing and when we have reached our altitude we can flatten the curve out into a speed section, and flit away as fast as we please. When we want to land we can then have slow speed with the possibility of landing in small space, and on rough ground. The development of this type of wing will probably be the next basic step in the development of the airplane.

### To Provide Landings

As the use of aircraft develops there will be established at all cities landing fields smoothed off and marked with the direction of the wind so that there will be plenty of space to land in and no rough ground. The use of the ideas described will add to safety, however, and in case one is flying a single engined machine he will still have the ability to make emergency landings in safety.

The coming of the multi-engined plane will eliminate the necessity for landing at other than prepared fields, and for commercial work two or more motors will be the rule and the one-engined plane the exception. With this type of plane and the prepared fields, with instruments for flying, and with skilled pilots, the safety part of air navigation can be considered as settled. Emergency landings nowadays are rare, and getting rarer. Almost all accidents are to student pilots under forced training who attempt feats before they are fitted to stunt



work. In the hands of skilled men flying, even today, is safe.

Passengers also must be totally inclosed out of the wind. They must be comfortably seated and warmed and enabled to see the country over which they are flying. They will be amused at wireless communication as they go along. The interior of the cars must imply safety and comfort, that nervousness may be a minimum. It may even be necessary to keep the air pressure in the passenger compartment normal on account of weak hearts at flying heights. All these things will come, and more which we do not even imagine.

### New-Type Instruments

The instruments for making the course accurate will be of new type. There will probably be certain established wireless wave length lines flowing between cities. A certain wave will float between wireless stations at New York and Chicago. In the plane will be a needle which will always point in the direction of this wireless wave, so that the pilot, through fog or rain or storm or totally enclosed in the cabin, can follow the line accurately as though strung on a cord. With this and barograph the plane can laugh at storms.

Having these in mind as a part of the method of carrying the passengers from place to place as a new transportation, we must also consider the speed of the machine in the air as a direct factor in making aircraft an eventual transportation. When we learn how to build planes for heavy lift high speed performance—and we are very near to it—we will be able to do with heavy bombers what we do now with speed scouts, and with machines designed for transportation of many passengers do feats which today the speed scout trickster could not attempt if he would.

"Operation of Motor Trucks in War Service Compared with Commercial Service," the paper by G. W. Smith, in part is as follows:

The subject of military trucks has received so much attention of late that it is somewhat of a waste of time to recount in full the various matters in connection therewith. Very complete data and comment have been furnished by various members of this Society and will be found in our publications of recent dates.

Changes desirable for service similar to punitive expedition in Mexico:

- 1—Great increase in cooling area of radiators probably 50 to 75 per cent.
- 2—An increase in low gear ability by means of increasing total gear ratio. This positively indicates a four-speed transmission with a low gear ratio of not over 20 per cent.
- 3—An increase in high gear ability by means of an increase in piston displacement. This value varies from 33 to 37 pounds per cubic inch of piston displacement.

### Necessary in Design

In addition to the requirements as given above it is necessary to design the suspension of the various units with the greatest care in order that distortions may be rendered unable to cramp or blind the various joints and moving connections. Many details of design need improvement and particular attention must be given to the lubrication of the various bearing points.

For service similar to that of the Allied armies in France the following is indicated:

- 1—Improved design of detail and greater refinement in workmanship, particularly with reference to American trucks.
- 2—Somewhat more liberal dimensions of the various parts.
- 3—Increased radiation in some cases.
- 4—Better design of motors, incorporating such features as full force lubrication, improved carburetion, more liberal bearings, crankshafts, etc.
- 5—Improvements in the design of clutch and transmission units to facilitate repair and preserve the alignment of the various parts.

The foregoing covers, of course, the deficiencies of the commercial truck and does not sum up their virtues. If such discussions were confined—as they are intended to be—to the engineering profession only good could result. The manufacturer of motor trucks, however, has to contend with some very adverse conditions in comparison with other industries.

The purchaser of locomotives is represented as a rule by engineers of the highest ability and knowledge. They know exactly what is wanted and what the apparatus they purchase can do. This is true in almost all other lines of machining, such as machine tools, rolling mill machinery, hoisting machinery, conveyors, etc. The sale of a motor truck is too often effected by a bombastic and ill-informed salesman who knows little or nothing of his prospect's needs. The buyer in most instances is a good business man but does not have the experience or training to properly judge the merits of the machine offered. In fact, a considerable part of the merchandising end of the motor truck industry is deficient in the elements that make for satisfaction to the buyer and seller.

### Performance of Trucks

The author desires to enter into a discussion of the performance of the various trucks in war service—particularly in Mexico—with a view of showing to what extent the ill report is justified.

The requirements of the service were, to say the least, extraordinary. The railroads, which should have carried the supplies, were in the hands of the "de facto" Mexican government, and, for reasons best known to our government, were not available for our service. This meant that trucks would of necessity be used where there were no roads and not a single favorable circumstance.

It is hardly conceivable that such a situation could arise. The conditions were neither those of peace or war, either one of which would have made it unnecessary to employ trucks as they were employed. In case of war railroads would have been seized and supply trucks could have operated from bases to supply points chosen with much more freedom and care as to road conditions. In case of peace, trucks could not hope to compete with railroads for the distances that were involved unless suitable roads were provided.

As to the maintenance of the trucks it is absurd to expect to provide anything that will show a reasonable operating cost under the conditions met with. The entire truck from tail lamp to front bumper was covered with a fine grit of first-class abrasive properties to a depth varying from one-eighth of an inch to one-half inch. Any joint sufficiently close to keep out this abrasive material would be entirely too close for lubrication requirements. It is not intended to state that the designs of trucks, as they existed at that time, could not be improved. As a matter of fact a great many improvements have been made in nearly all the trucks used and a few have been practically redesigned.

What can be stated with absolute certainty is that the average truck stood up well when it is considered that it was not intended to perform the service to which it was applied. As was stated in the *Automobile Engineer* (London) the failure of English trucks in war service on the Continent demonstrated that they were efficiently designed. The designer did not contemplate such service and the usage constituted practically a breakdown test.

### Development in Tires

An important development now going on is the use of large pneumatic tires in sizes as large as 10-in. section and it is stated that sections of 15-in. are commercially possible. The use of pneumatic tires does not mean simply putting them on existing chassis, but will demand large motors and higher gear ratios to keep the motor speed at a normal value. It will also be possible to reduce the dead weight ratio to the

pay load and greatly increase the efficiency of operation.

The current trade papers state that a service of such trucks is regularly maintained between Akron and Boston at speeds equalling or surpassing express trains.

All prophecy is dangerous, but one does not have to draw upon their imagination greatly to see profound changes as the result of such a development.

### May Extend Lines

The heavy duty low speed truck may also extend the operating lines of trucks to territories now considered impossible. Road conditions involving deep mud and sand where the tractive resistance may be around 500 pounds to the ton may be dealt with successfully. On the other hand, it is extremely doubtful if sufficient power can be utilized by a rear drive vehicle to pay for the greatly increased cost of construction and operation that of necessity goes with more power. The maintenance problem is by no means solved, as it must be remembered that any increase in torque must be taken care of by a corresponding increase in all the driving and supporting mechanism. The more powerful the vehicle, the more ability it has to destroy itself. The spectacle of the motor size chasing chassis weight up and down the scale may be presented again for the edification of men and the amusement of the gods on high Olympus. Only a few years ago the automobile had arrived at a state of development where it would operate with fair satisfaction and economy. Immediately there arose a demand, faithfully transmitted by the sales organization, for more power. The power was accordingly forthcoming and almost immediately the cry went up that the power was all right but the chassis was entirely inadequate. The next year the chassis was strengthened with the result of an increase in weight and a decrease in power. This alternate change continued until the advent of the multi-cylinder motor when the pressure was somewhat relieved. The simile between past history and the subject under consideration is possibly greater than is generally appreciated.

Possibly the most satisfactory application of the increase in power is to drive on all four wheels of the vehicle. This can be accomplished with a relatively small increase in weight and increases the ability of the vehicle to an extent that eclipses anything that can be hoped for in two wheel driven vehicles. The effect is greatly augmented by the use of some form of friction differential. There is no question that the conventional truck can use a large amount of power when operated on dry hard roads, but as sand roads and mud are to be negotiated the increased power is of little use, as the wheels easily embed themselves and have no ability to drive the front wheels forward or even to get themselves out of the hole. The use of mud hooks and chains may help to some extent, but often results in merely burying the wheels deeper and deeper in the sand or mud.

### Operation More Profitable

As time goes on the road conditions improve, grades are reduced and it becomes constantly more profitable to operate trucks. It is possible that some kind of finality may be achieved in the design of trucks. Until such time standardization should be undertaken with extreme caution. Any general standardization should be undertaken only as an extreme military necessity and not as a proposition likely to do good to the industry.

This remark does not apply to the various matters of detail such as spark plugs, magneto bases, screw and bolt sizes, etc., or even to the question of standardizing such things as wheel gauges. The last subject mentioned should be handled rather gingerly perhaps in view of the inconvenience caused by the standard gauge of railroads.

# Good Samaritans to Fighting Men in France

By W. F. Bradley

Motor Age's Special Correspondent with the Armies in France

OFFICIALLY each infantry division of the French army, which consists of 16,000 men, has at its disposal one motor ambulance section consisting of twenty vehicles. These twenty vehicles are responsible for the removal of wounded men from the regimental first aid stations to either the operating or the general clearing hospital located from 6 to 12 miles in the rear, according to circumstances and general conditions. The work of a sanitary section is intensely variable; there are times when the divisional work could be carried out with ease by two cars, and there are periods when the whole twenty, working at highest pressure, are inadequate to deal with the rush of wounded. Thus, while a section to a division is the officially recognized proportion, in times of activity arrangements have to be made for reserve sections to be placed on the attacking front and for drafts to be drawn from sectors which are quiet and not likely to need ambulance assistance.

## Work Varies Greatly

The variable nature of the work necessitates the most careful organization if the wounded are to be attended adequately during periods of great military activity. The utilization has not always been of the best, as is proved by the discussions in official French circles of the manner in which the sanitary service has operated

under periods of great stress. There has been discussion as to whether the ambulances should be under the control of the medical staff, or of the motor car officers acting under the direction of the headquarters officers. The doctors have claimed that motor car officers sometimes are more interested in keeping their cars in good condition than in getting the wounded away quickly and have inferred that had they, the doctors, had complete control, the number of men carried in any given time would have been increased.

It is obvious, too, that the headquarters staffs frequently have been too much disposed to treat those of the ambulance service as outsiders who need never be taken into consultation and who need never be informed until the last moment of pending military operations. When this spirit has prevailed it is evident that the ambulance sections have not been placed to the best advantage, nor, for lack of adequate warning, have they been able to work at maximum efficiency.

Undoubtedly the ambulance service should be in the hands of motor car officers and not under the direct control of the doctors. The latter have not the experience necessary to get the best results out of a fleet of mechanical vehicles. A medical man can be excused for a display of annoyance at the withdrawal of motor cars during the height of an action, but

the motor car officer may know that the withdrawal for a few hours at the opportune moment may mean the saving of a vehicle from complete mechanical destruction and thus be to the ultimate benefit of the entire service. To get the best results it is essential that the ambulance service have the confidence of the general staff so the vehicles may be prepared for the work about to be thrown on them.

In addition to the twenty ambulances, each sanitary section has one motor truck with tools for running repairs and a capacity for general stores, frequently a motor car trailer on two wheels, a touring car for the use of the lieutenant in charge of the section and a motorcycle for the despatch rider. The truck and the trailer have a very small mileage, for the former is only used to bring up general stores—gasoline, oil, food, etc.—and to transport the general stores of the section when a change of base is ordered.

## Carries Sleeping Quarters

A motor ambulance section on front line work must carry its own sleeping quarters, in the shape of light tents, though these are used only when it is absolutely impossible to find shelter in permanent buildings. Generally the forty-six men in a section—forty drivers, two mechanics, two cooks and two officers—can find more or less satisfactory accommodations in wrecked buildings behind the positions they are to work. It is only after an advance into country which has been subjected to a very heavy bombardment that the whole of the mobile equipment has to be brought into use.

Taking an average case, the section will select as its quarters some building or group of buildings, which are disinfected immediately. If there is a kitchen, it is made use of; if not, the cook stove carried on the trailer is placed in some shed or outbuilding. The trailer is placed permanently in position and becomes the mechanics' shop; the touring car and motorcycle are garaged nearby. The main duty of the lieutenant in charge is to keep in touch with the regimental dressing stations from which he will have to evacuate, to transfer his cars, as the action develops to the points where their services are most required, and to maintain a directing control over the entire organization. The two mechanics are responsible for the mechanical efficiency of the section and in times of activity must get temporary disabled ambulances on the road again with the least possible delay. Generally they take charge of tires, so that any driver coming in with a puncture or blow-out finds another wheel with tire mounted awaiting



Ambulances work right up to the trenches on the fighting fronts. The one shown here is taking on wounded direct from a trench



him. The mechanics possess nothing more than a good set of hand tools and practically no spare parts other than bolts, nuts, washers, split pins, etc. They are expected to do running repairs and not general overhauling.

As an indication of the work which can be done by motor ambulance the following figures taken from the return sheets of a section seen in operation on the French front are interesting. In a period of 24 hr. the twenty ambulances of this section had carried 700 men, or thirty-five men a car, in 24 hr. During a period of six consecutive days the twenty ambulances carried 8000 wounded men, or an average of sixty-seven men a car a day. The former figure of thirty-five men a car a day was during a period of moderate activity; the second figure, sixty-seven men a car a day, represented a maximum attained during a great battle. It must be remembered that these two periods represent military activity when stretcher cases as well as sitters have to be carried. Thus, when the greatest effort is required, the number of cases carried each journey is the lowest, for an ambulance which will carry eight sitters, or ten in an emergency, cannot accommodate more than four stretchers.

#### A Normal Case

Taking the first case as normal, the 700 cases represented 500 sitters and 200 stretchers; this represents 113 journeys, or six trips a car a day. As the hospital was 8 miles behind the lines, this gives an average of 96 miles a car a day. The greater proportion of this front line work has to be done over shelled roads and under very heavy traffic conditions, owing to supplies and reserve troops being hurried to the front. Thus to average thirty-five men and 96 miles a day calls for really serious work on the part of drivers. It readily can be seen that to carry this average up to sixty-seven men a day, with a corresponding increase in mileage, and maintain this average for six consecutive days is a task of no small proportions. It is indeed very near the limits of endurance of the men and material. French regulations call for two drivers to a car, but to get the maximum efficiency during this period of stress only one driver was employed during daylight hours, so that each car was running without interruption for 1444 hr. consecutively, and the men average 16 hr. consecutively a day.

#### Three Years in Service

The section from which these returns are taken consisted of Rochet-Schneider touring cars chassis with special ambulance bodies. They had gone into service August, 1914, and for three consecutive years had never been away from the front, all their repair work being done by the mobile workshops attached to the armies. While going over the return sheets the major suddenly turned to the lieutenant in charge of the sections and said, "If a hurry up order came along how many of your twenty ambulances could you send out right away?"

"Nineteen," was the answer, "and the twentieth within 24 hr."

An examination of the section at its quarters a few miles back of the lines proved that its mechanical condition was

undoubtedly high. The bodies bore every evidence of hard work and encounters with bits of shrapnel. The paint was certainly not of the best, but the interiors were clean and, considered mechanically, the motor cars were in a condition to satisfy the men who draw up lubrication charts and write mechanical hints. It was obvious that the officer in charge insisted first on perfect cleanliness of mechanical parts, so that it was impossible for wear to set up or looseness to develop under a layer of greasy mud, unknown to the driver. Regular and adequate lubrication of all parts not provided for automatically was attended to; minor defects were treated as they developed, the two section mechanics being responsible for their detection; also at regular intervals the vehicles were taken off the road and examined more carefully than it is possible for drivers to do in their daily cleaning.

There is no secret about the methods necessary to keep an army fleet of motor cars in the best condition, for it is the method adopted by all the big motor car transportation companies, with much of the polish and paint cut out. Nevertheless, it is a much more difficult matter to get the same standard in war service as in peaceful civilian duties. Experienced convoy officers will overlook a thick coating of mud

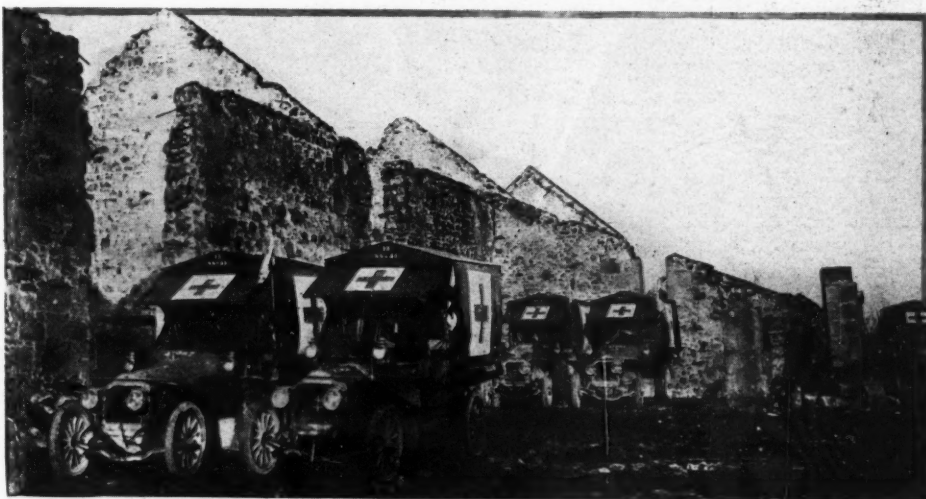
on the outside of the underpan, but they have no pity for the driver who lets his ignition wires chafe, who allows his gasoline line to get adrift, who runs his tires under-inflated, who allows steering connections to be coated in mud and go ungreased, who has loose hose connections or who does not report a leak in the radiator.

#### Vouchers for Supplies

Gasoline and oil supplies are in the hands of the section mechanics, who only issue them on presentation of vouchers signed by the drivers. It is customary to fill the tank at the beginning of each day's work, this supply being sufficient to run for 24 hr. without refilling. The amount of fuel given out is entered up against the car receiving it. No driver is sent out without a written order from the officer in charge, and on returning to headquarters each driver must report the number of runs he has made, from what points and the number of men carried. The officer calculates the distance covered from these reports and enters this distance in the books opposite the gasoline supply. Although no ambulance goes out without an order, a certain amount of liberty of action has to be left to the men when on front line work. The dressing station may be busy and keep the ambulance going trip after trip



A section of Fiat standardized ambulances used by the French army. The Fiat Co. has been making ambulances and trucks for all the allies.



This ambulance section is engaged in front line work. Note the ruins through which it is passing in its transporting the wounded.

without a stop; it may be for hours on end. It frequently happens, too, when working on shelled roads, that the drivers pick up men as they fall and hurry with them to the nearest dressing stations, or they are hailed by the traffic police and loaded up with cases which will not brook an instant's delay. This is the unforeseen but ever-to-be-expected feature of an ambulance driver's life. Whatever the incidents all are noted on the back of the order form and handed to the officer at headquarters.

## Little Bookkeeping

This system involves a minimum of bookkeeping and yet gives accurate control. The gasoline question has been worked out so carefully that the officer in command of the motor car service for one of the French armies informed me he could estimate to within 10 per cent accuracy the gasoline consumption for an army division for any given month. The amount varies according to weather and road conditions—it is not the same in January as in July. Narrow roads and poor surfaces

make one district show a higher gasoline consumption than another; during an offensive the miles per gallon goes down a little owing to the greater amount of time the engines are running idle in traffic blocks. Carried out on the big scale prevailing on the French front, very valuable data is obtained. Not only does an extravagant section reveal itself immediately by comparison with its companions, but the qualities and defects of different makes of engines and carbureters are revealed so accurately that the authorities have been able to insist on makers adopting improvements, and in some very important cases they have scrapped carbureters originally supplied in favor of others that proved themselves sufficiently economical to pay for the change.

Incidentally it may be mentioned that the same system has been applied to touring cars, every machine being given a log book in which must be entered gasoline, oil, tires and spares received, repair work done, trips made and mileage covered. Theoretically the officer should sign for every trip; in practice, however, it is very

difficult to keep these books up to date, for the officer neglects to sign and the driver does not like to insist. These difficulties are not met with on the general motor car and ambulance service, however, where there is a section officer in charge.

Most of the early French ambulances are slightly modified touring car chassis, the modifications being a longer wheelbase and a rather big rear overhang. The section to which reference has been made in this story consisted of Rochet-Schneider four-cylinder cars of 95 by 140 mm., about 3.7 by 5.5 in. bore and stroke. They were carrying four stretchers or eight sitters—occasionally ten sitters would be put in, making a total load of twelve with the two drivers—and according to the return sheets their lowest gas consumption was 22 liters and the highest 27 liters per 100 kilometres. This is equivalent to 10.3 and 8.7 miles to the American gallon and was considered satisfactory for the kind of work undertaken, for it consisted of going to front line positions, frequent waiting with the engine running idle and delays on account of traffic blocks.

In place of the four-stretcher ambulance the French have adopted a standard type of five-stretcher body, in which the center aisle is made use of to carry a fifth man. In practice this center aisle never is needed, for wounded soldiers never are attended unless they have gone mad, and in such a case only one patient is carried at a time. The great majority of these standardized bodies are fitted to Fiat chassis, which are light truck types on touring car lines with four-cylinder engine of 80 by 140 mm., about 3.1 by 5.5 in., bore and stroke, four-speed gearset and steel disk wheels, with twin tires on the rear. Providing the axle has been designed for carrying twins, these are much more advantageous than singles for ambulance work; tire troubles are diminished, and the cars can operate on grease and in snow which can be negotiated only with difficulty with tire chains on single tires. By the use of a light but fully inclosed wood body it has been found possible to produce a very successful ambulance with an engine as small as the 80 by 140-mm. Fiat.

Some of the sections on the French front, particularly those handled by Americans, are using Ford ambulances exclusively. Before the Fords are sent to the front the motor car authorities put an extra leaf in the rear spring, making nine, fit a tie rod under the rear axle housing and put 3½-in. tires on the front wheels. With these changes and a very light canvas body the cars are considered satisfactory. Drivers speak well of them and claim that they can do better front line work than any other vehicle. They are limited, however, to two stretchers and six sitters; thus when evacuation has to be undertaken they are hopelessly outclassed by the European types.

## 370,000 TRUCKS IN COUNTRY

Detroit, Dec. 14—According to estimates made by the truck department of the Packard Motor Car Co. there are at present 370,000 motor trucks in this country. The loads these trucks are carrying are stated to average only about 45 per cent capacity, representing an average daily loss in de-



One of the Ford ambulances being used on the western fighting front. Please do not overlook the American flag on it



A close-up of the Fiat standardized type of ambulance used by the French army. Solid wheels are a noticeable feature



preciation overhead alone of \$1.05 for every truck in operation.

In view of increasing this efficiency the Packard company recommends that owners increase the loads as much as possible. An increase of 70 per cent capacity will average a daily saving of 48 cent a truck, amounting to a total daily saving of \$177,600 and yearly saving of \$53,280,000.

#### SYNDICATE BUYS GLIDDEN

Cleveland, Ohio, Dec. 14—The Glidden Varnish Co. has been purchased outright by a syndicate headed by Adrian D. Joyce, formerly director and general sales manager of the Sherwin-Williams Co. The price paid was \$2,500,000. O. A. Hasse, manager of paint and varnish sales and R. H. Horsburgh, controller of the Sherwin-Williams Co., will be vice-president and secretary-treasurer of the new com-

pany, both having resigned from the Sherwin-Williams Co. Plans are under way to extend the present factory which already covers 17 acres.

#### SCRIPPS-BOOTH CONTROL

Detroit, Dec. 15—The new board of directors of Scripps-Booth, which is now under the control of the General Motors Co., was completed yesterday by the election of W. C. Sills, general sales manager of Chevrolet, as director. The full board, as it now stands, is as follows: President, A. H. Sarver, formerly manager of Buick Motor Co.; directors, Fred. W. Warner, president and general manager of Oakland; Edward Verlinden, president and general manager of Olds Motor Works; W. C. Sills, general sales manager of Chevrolet; W. H. Little, formerly president of the Sterling Motor Co.; F. J. Sensenbrenner, vice-presi-

dent and treasurer of the Kimberly-Clark Co., Neenah, Wis.; and N. J. Miller, New York banker.

The first of the new six-cylinder cars to be exhibited at the New York and Chicago shows was inspected at the election. The feature of this car is to be a six-cylinder valve-in-head engine, 2½ by 4¾ in. having the cylinders cast in block.

#### TO TEST NEW FUEL

Washington, Dec. 17—Special telegram—Thomas A. Edison and four other well-known scientists, soon will be called upon to test the genuineness of what is claimed to be the greatest invention of mankind. The Garabed resolution providing investigation of the discovery by Garabed Giragossian of a virgin natural force passed the house to-day and now requires approval of the Senate and the President.

## Don't Make Your Own Traffic Rules! Be Careful!

### PROTECT BOTH YOURSELF AND THE OTHER FELLOW

**T**HERE is a great need on the part of many motorists and pedestrians for a fuller understanding of each other's rights. Traffic regulations are intended to operate for the *safety of all*. A little use of plain "horse sense" and a little more respect for the other fellow's rights would eliminate a great many accidents that result in *death, injury, property damage* and no end of *mental anguish and physical suffering*. "Jay-walking" develops into sudden death or a prolonged stay at the hospital just as often as does *wild, reckless driving* by speed maniacs.

The purpose of this announcement is to point out the means of eliminating the bulk of the accidents.

Read, remember and observe

#### DON'TS For Drivers

- DON'T approach street intersections at high speed.
- DON'T forget that the traffic officer regulates traffic.
- DON'T resent the traffic officer's directions—he is doing his best to prevent accidents.
- DON'T forget that the street car cannot dodge.
- DON'T overlook the rights of the pedestrian—his life is just as important as yours.
- DON'T fail to give signal with hand when turning or stopping.
- DON'T ignore special traffic rules.
- DON'T drive on the left side of street or cut corners.
- DON'T permit your chauffeur to speed. You are just as guilty as he, and also may be prosecuted.
- DON'T use your big headlights—they blind other drivers and pedestrians.
- DON'T take blind curves at high speed.

*Better Be Safe Than Sorry*

THIS CAMPAIGN IS SUPPORTED IN THE INTEREST OF HUMANITY BY THE FOLLOWING MANUFACTURING INTERESTS, PUBLIC SERVICE CORPORATIONS, FINANCIAL INSTITUTIONS INSURANCE COMPANIES, FIRMS AND INDIVIDUALS

#### DON'TS For Pedestrians

- DON'T cross streets before looking both ways.
- DON'T let your mind wander when standing where vehicles pass. You invite accident by doing so.
- DON'T STAND in traffic route when waiting for street car. Remain on sidewalk or in safety zone until street car approaches.
- DON'T run across the street in front of a car, auto or wagon. When the way is clear, cross the street at a fast-walk. DON'T RUN.
- DON'T cross street except at the regular crossing.
- DON'T unnecessarily impede traffic; do your part in avoiding accidents.
- DON'T cross street intersections diagonally.

#### SAFETY for Children

—Each child should be taught to remember that:

- I must not cross a street without first stopping and looking both ways.
- I must not play in the street, especially in one frequently used by automobiles and other vehicles.
- I must not attempt to run if I am caught in the middle of the street with vehicles coming from both directions, for if I stand still they will be likely to go around me without harm.
- I must not steal rides by hanging on the back of wagons, trucks, automobiles or street cars.
- I must not throw a stone or other missile at any vehicle.
- I must not use roller skates or coasters on the streets.
- I must stay on the right side of the street and near the curb while riding a bicycle.
- I must not start or take part in a panic when a fire starts in school. I should remain in my seat until I can walk out without danger of being crushed in the aisles.
- I must not run my bicycle too close to street car or automobile or catch on either of them, or use an air rifle, slingshot or pea shooter within the city limits.



Above is an advertisement in which Chicago manufacturers, public service corporations, financial institutions, insurance companies, firms and individuals co-operated. It speaks for itself



## Trucking to Help Whip Bill Kaiser

**H**OW motor trucks are helping win the war becomes more evident with acquaintance with the various motor truck fleets in operation as highway freight trains. Along the Atlantic seaboard in particular they are supplying rapid inter-city transportation for large consignments of freight, machinery, foodstuffs and supplies necessary to winning the war. Freight congestion and embargoes have been lifted through these sturdy highway travelers in the delivery of raw and finished materials for export. Regular schedules are maintained. In the lumber districts of the Northwest trucks have gone into the forests and brought out millions of feet of spruce and other lumber used in the building of airplanes, ships and other much needed war materials in about half the time that ordinarily would be required.

### Akron to Boston

The Goodyear Tire & Rubber Co. is operating a line called the Akron & Boston Express. The equipment consists of two White and two Packard trucks, of 1½-, 3- and 5-ton capacity. Other trucks are to be added soon. The trucks usually are on schedule time, making the round trip of 1510 miles in less than a week. This is faster than delivery by express, and the truck costs are competing with express rates. Tires are loaded for eastern branches, and cotton fabric and machinery for the Akron plant are carried on the return. Several trips have been made to the Capital with war orders. The service was started last

April and will continue through the winter unless the ice and snow become too bad.

When the Emergency Fleet Corp. commandeered the plant of a large shipbuilder on the Atlantic and extensions to increase production was proposed, there arose a difficulty as to getting the large contract piles for the shipways. The contract was awarded on the condition that work begin within two days. Railroad facilities were unavailable. The contractor's pile-driving equipment was 25 miles away. But a Philadelphia hauling contractor moved the entire outfit, consisting of pile-driving tower, turntable and bed sills, giant boilers, engines and additional equipment in 18 hr. with a fleet of White trucks.

The Beam-Fletcher Corp. of Philadelphia operates a fleet of twenty-two trucks, White, on regular daily schedule between Philadelphia and New York. These trucks have been in service over this route since July 1. Part of the fleet leaves Philadelphia at 8 at night and arrives in New York the next morning at 6. At some point between the two cities the Philadelphia train meets another fleet which leaves New York at 5 in the afternoon and reaches Philadelphia at 3 the next morning. Under present conditions it would require from five to seven days to ship the same consignments.

On specified days in the week or by special arrangement the Beam-Fletcher trucks make trips to Washington, Baltimore,

Philadelphia trucking fleet that runs on daily timetables between Philadelphia and New York. Trips to other cities are made by these trucks on specified days or by special arrangement for their service

Wilmington, Hartford and New Haven, Conn., Springfield and Boston, Mass., Providence, R. I., Harrisburg, Reading and Bethlehem, Pa., Trenton, Newark and Jersey City, N. J., and other cities in nine different states. Anything from a pound to several thousand is handled with delivery guaranteed. Frequently the loads are insured for as much as \$50,000 a single trip. Recently 14,000 lb. of finished leather were carried from Philadelphia to New York for export. Moving picture films are carried daily between the two cities. Machinery, clothing, woolen goods, textiles, foodstuffs and fish have been transported. One of the largest musical concerns has placed a contract with the corporation for hauling records. Eighteen trucks have carried 180,000 lb. of these records to New York in a day.

Two tanks, each 20 ft. long, 8 ft. wide and 3 ft. high, weighing about 24,000 lb., were hauled by two trucks from Chester to Reading, Pa., 14 miles. Materials for batteries have been hauled from Philadelphia to New Haven, Conn., 275 miles. Early in November, 5 tons of Red Cross supplies were loaded in Philadelphia and delivered in Boston for export, the distance of 330 miles being covered in less than two days.



Large quantities of yarn and raw textile mill materials have been transported from Philadelphia to New York by truck and re-shipped to avert demurrage due to an embargo effective on shipments from Philadelphia to many New England points.

Highway motor truck express lines have been operating successfully in other parts of the country for some time. The Eucalyptus Farm Co., Homestead, Fla., the Florida East Coast Farm Co., and J. F. Peoples, Miami, Fla., have been operating a truck line in the great tomato belt. The Coca-Cola Co. has been operating a truck line from Jackson to Hazelhurst, Miss., 47 miles, for two years, competing successfully in both cost and service with the railroad. From these and other experiences it is evident transportation troubles can be solved by the highway truck express. What really is needed to make it most highly successful and to encourage establishment of such lines are good roads.

### FARM-TO-TABLE TRUCKS

Washington, Dec. 15—J. A. Thornton, postmaster at Philadelphia, Pa., is inaugurating a farm-to-table movement by the use of motor truck parcel post routes between Philadelphia and Baltimore, utilizing the products of the farmers between these cities. Later it is planned to extend the service to New York and Pennsylvania points. Two trucks will operate at the beginning, working on a regular schedule and accepting all kinds of parcels with preference given to perishable food products such as butter and eggs. The postal authorities hope to show the great value of this work and anticipate that a whole fleet of trucks may be in operation within a year. It also is planned for the future to lower parcel post rates to make this service attractive as possible to the farmers and dealers.

### ENGLAND CENTRALIZES DELIVERY

London, England, Dec. 10—The English government has already evolved a general scheme for organization of road traffic, and now this is followed by an announcement that the Ministry of Munitions will develop a plan whereby the majority of trucks and even horse vehicles used in delivery will be placed under a co-operative control administered by it. The idea is that

## Schedule of Akron & Boston Express Trucks

	City	Time		Miles	Remarks
		Arrive	Leave		
Sun., Mon., Tues., Wed., Thur., Fri., Sat.	Akron.....	6:00 pm	6:00 am	90	Fill with gas
	Beaver Falls.....	3:00 pm	3:30 pm	120	Fill gas. Telegram
	Pittsburgh, Pa....	6:30 pm	7:00 pm	151	Fill gas. Telegram
Mon., Tues., Wed., Thur., Fri., Sat., Sun.	Greensburg, Pa....	11:30 pm	12:00 pm	216	Fill gas. Telegram
	Bedford, Pa.....	10:30 am	10:45 am	270	Fill gas. Telegram
	Chambersburg, Pa....	7:00 pm	7:30 pm	300	Fill gas
Tues., Wed., Thur., Fri., Sat., Sun., Mon.	Gettysburg Pa....	10:45 pm	10:45 pm	356	Eat
	Lancaster, Pa.....	5:00 am	5:30 am	443	Fill gas
	Philadelphia, Pa....	11:30 am	12:00 am	505	Fill gas. Telegram
Wed., Thur., Fri. Sat., Sun., Mon., Tues.	Trenton, N. J.....	3:30 pm	4:00 pm	560	Fill gas
	New York, N. Y....	10:00 pm	.....	617	Fill gas
	Bridgeport, Conn...	3:30 am	4:00 am	643	Eat. Wire
	Hartford, Conn....	9:00 am	.....	700	Wire
	Springfield, Mass...	1:00 pm	1:30 pm	740	
	Worcester, Mass...	6:00 pm	6:30 pm		
	Boston, Mass.....	10:00 pm	.....		

every vehicle should carry the nearest approach to 100 per cent load at all times.

This organization for stores is only a plan so far but for larger loads a similar system has been in use in various parts of England for some time. A maker with goods to move applies to the ministry for trucks. The officials in charge find another firm wanting service near the delivery point for the first maker, and trucks are sent to deliver the goods, reload on the next order and so on. Standard rates are by the hour. This cuts down the idle mileage to a minimum. Just now no compulsion is placed on the employment of the ministry's services by traders, but it is expected that legislation may come later.

### CONGRESS CONSIDERS NEW FUEL

Washington, Dec. 15—A special rule for consideration immediately after the passing of the pending postoffice appropriation measure of a bill authorizing investigation of the Garabed discovery was approved yesterday by the House rules committee. Garabed is the power that it is claimed will drive anything from an airplane to a battleship without fuel. The bill provides for protection of the rights of its discoverer. Features which caused President Wilson to veto a similar bill last session have been eliminated.

### POSTOFFICE BUYS TRUCKS

New York, Dec. 15—The Government has bought about 150 motor trucks of  $\frac{3}{4}$ -,  $1\frac{1}{2}$ - and 3-ton capacity for operation in the New York district in mail transportation. It is estimated that the Government saved \$500,000 last year in six cities

through operating its own trucks. The plan already has been adopted in Chicago, Buffalo, N. Y., St. Louis, Mo., Philadelphia, Pa., Detroit, Boston, Mass., and Indianapolis, Ind., and has been successful in each.

### HOODS FOR RADIATORS

(Concluded from page 19)

rolls from the top down and the flap can be quickly adjusted for varying temperatures. Buttons in the shape of curtain fasteners are placed at intervals along the sides of the opening so that the flap can be snapped in place wherever desired. When ordering these covers it is necessary for the owner to give the name and year model of his car in order that the cover will fit the radiator properly. Price of the Allen radiator cover is \$7. Allen Auto Specialty Co., 2007 Michigan avenue, Chicago.

H.M.—This cover differs from the conventional types in that it is composed of eight adjustable metal shutters operated by a quadrant device extending through the floor board and attached to a shifter rod. Thus the owner can adjust his cover without leaving the seat. The shutters in the panels permit a complete opening for moderate weather, half open for long runs in cold weather, or completely closed for starting, or running short distances in cold weather. The cover is made of sheet metal and can be used season after season. It is fastened to the radiator by four spring bolts and can be attached in a few minutes. It is made for Ford cars only and will fit all models. Price, \$5.—H. M. Mfg. Co., 122 Michigan avenue, Chicago.



Highway freight trains operated by Goodyear between Boston and Akron on a schedule that calls for a round trip between Akron and Boston, 1510 miles, in less than one week



# Electrical Equipment of the Motor Car



*By David Penn Moreton & Darwin S. Hatch.*

**Editor's Note**—Herewith is presented the seventy-third installment of a weekly series of articles begun in MOTOR AGE issue of June 29, 1916, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the U. P. C. Book Co., Inc., New York, in a size to fit the pocket conveniently.

## Part LXXIV—Electrical Accessories

**T**HE object of the electric brake is to provide an easily-operated electrical means of applying the brakes on a car and thus do away with the manual labor usually connected with their operation. In the Hartford electric brake a high speed series motor is used, and this motor may be wound so that it may be operated from any voltage source of electric energy

available. For motor car work the more common voltages are 6, 12 and 24 volts. The armature shaft of the motor carries a worm which engages a worm gear, the reduction being 100 to 1. This worm gear drives a drum through the medium of an internal gear at a reduction of 4 to 1, which makes the total reduction from motor shaft to drum 400 to 1. The pull of the motor is transmitted to the brake mechanism by a steel cable one end of which is attached to the brake equalizer and the other end winds on the drum.

The motor is controlled by a special controller mounted within easy reach of the driver as shown in Fig. 411. The first point on this switch, which is a two-point affair, gives ample braking power for all ordinary requirements, while the second point gives a much greater braking power and is used in making emergency stops. Restoring the switch to its original position immediately disengages the brake.

The motor used in operating the brake is capable of making 10,000 revolutions per minute when running idle, and under load it can exert a pull of 1000 pounds at a speed equivalent to a quick application of the hand emergency brake. A slipping clutch prevents the motor from exerting a pull in excess of 1000 pounds, and a ratchet prevents the brake from slipping off. The powerful pull excited by the motor on the brake cable permits of operating the emergency brake in oil. The motor will take a current of 40 amperes for approximately two-fifths of a second from a 6-volt battery for each application of the emergency brake.

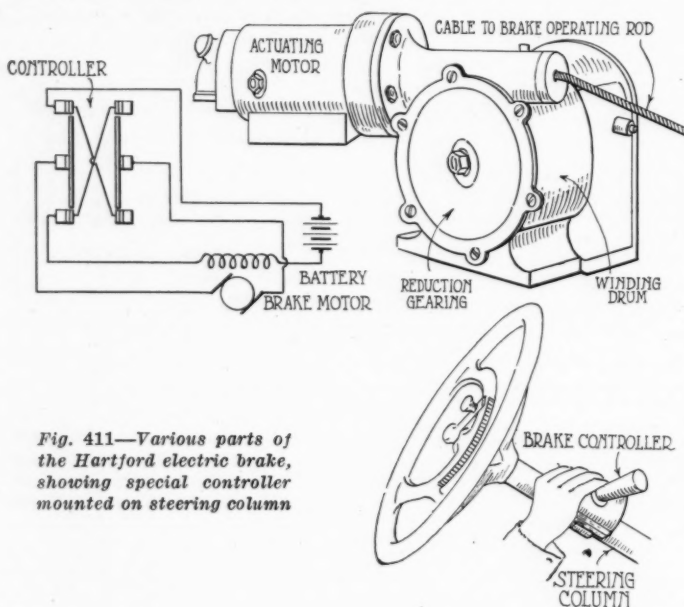


Fig. 411—Various parts of the Hartford electric brake, showing special controller mounted on steering column

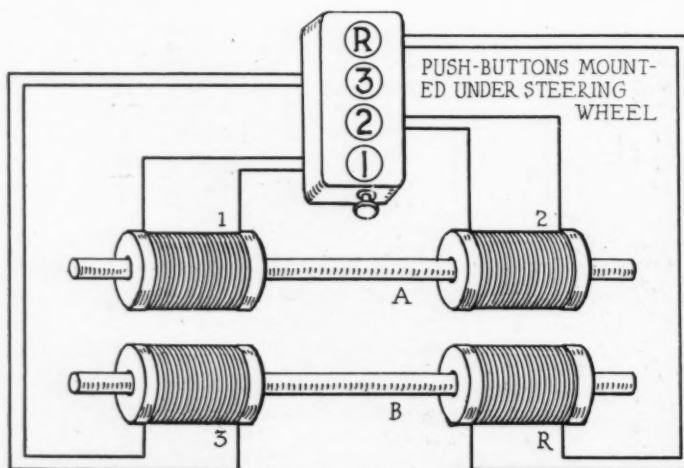


Fig. 412—Principle of operation of electric gearshift in simplified form

### Electric Vulcanizers

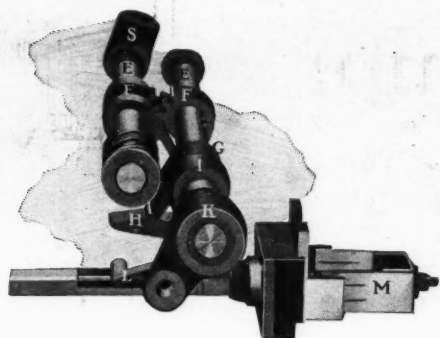
The electric vulcanizer is a vulcanizer in which the heat is supplied by passing an electric current through a resistance unit. This resistance unit is mounted in half of the vulcanizer or in one of the plates. Thermostats are provided in some for automatically cutting off the current when the temperature has attained the correct value, and others have a thermometer opening or pocket into which a thermometer may be placed and the temperature observed. These vulcanizers are provided with flexible leads and are wound for different voltages ranging in value from 6 to 110 and 220.

### Electric Gearshift

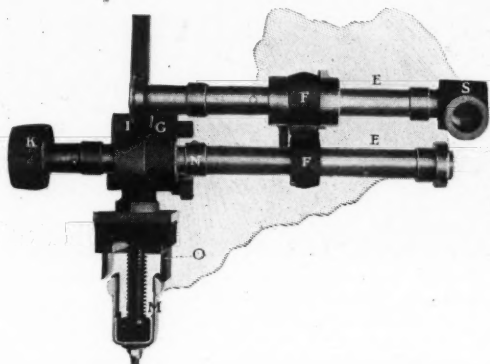
The electric gearshift is another valuable addition to the electrical equipment of the motor car which has been made possible by the installation of a charging generator and a constantly charged storage battery.

Four movements are necessary to engage all of the speeds in a standard three-speed forward and out speed, reverse gear of the selective type. These various changes are carried out as follows: A sliding pinion is used for first and second speeds, a toothed clutch for the direct drive and an idler between two of the gears for giving the reverse speed. All of the preceding





*Fig. 413—End view of Cutler-Hammer neutralizing device and master switch*



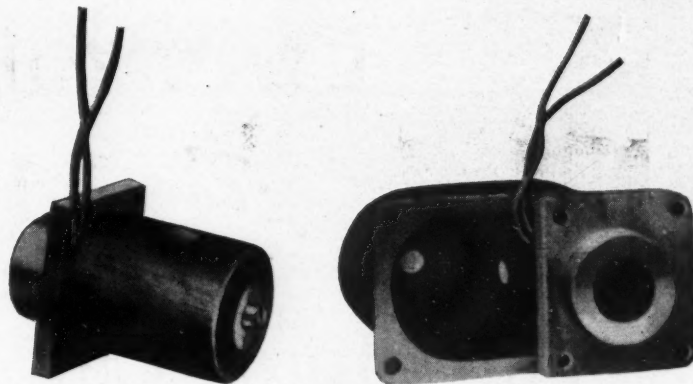
*Fig. 414—Plan view of Cutler-Hammer neutralizing device and master switch*

movements are accomplished by a yoke attached to the member being moved. The yoke is attached to a movable bar, which is in turn connected to the hand lever through a convenient linkage. The electrically-operated gear is identical to the one described and all the parts mentioned are retained with the exception of the hand lever. The two movable bars to which the yokes are attached are lengthened somewhat, and their ends form armatures or cores for four solenoids.

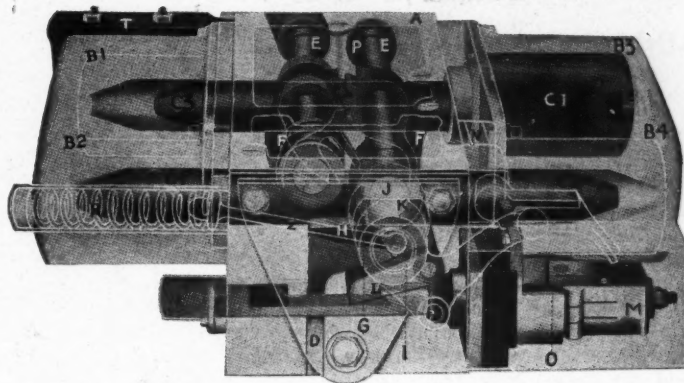
The principle of operation of the electric gearshift may be understood easily by reference to Fig. 412, which shows in a simplified diagrammatic form the operating electrical circuit, push buttons and solenoids. There are four solenoids, one for each movement necessary. If you press button 1 you close the circuit solenoid 1, causing the movable bar A to move to the left. If you press button 2 you close the circuit to solenoid 2, causing the movable bar A to move to the right. If you press button 3, solenoid 3 is energized and the movable bar B moves toward the left, while if you press button R solenoid R is energized and the movable bar moves toward the right. Pressing the button N, called the neutral button, and then throwing out the clutch neutralizes the gears, that is, all gears are disengaged and the engine is no longer connected to the propeller shaft.

The above buttons, which are mounted within easy reach of the driver, usually upon the steering post, when pressed do not entirely close the circuit to the respective solenoids but merely place the particular solenoid which they control in connection with what is called the master switch. These buttons themselves are referred to as selector switches, because they select in advance the circuit and hence the solenoid which will be energized when the master switch is closed. The master switch is controlled by the clutch pedal, and it is closed when the clutch pedal is pushed down to the extreme position. The clutch pedal has ample movement so that the clutch may be disengaged without closing the master switch.

In stopping the car the neutral button is pressed and the clutch pedal pressed all the way down. When the neutral button is pressed, all the contacts which may have been closed previously by the selector switch buttons are broken, and depressing the



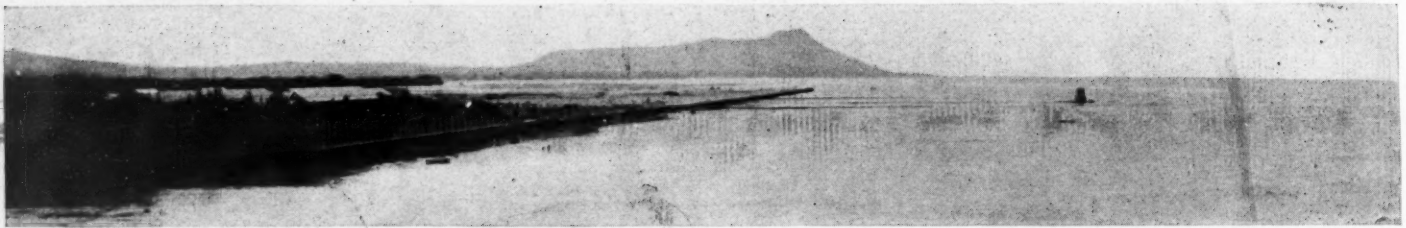
*Fig. 415—Cutler-Hammer solenoids and container for electric gearshift*



*Fig. 416—Phantom view of Cutler-Hammer electric gearshift*

clutch pedal then brings into action what is called the neutralizing device. For example, if the car has been running on high and you desire to stop, the neutral button is pressed and the clutch pedal pushed all the way down against the floor board. This causes the lever K, see Fig. 413, to move forward and then the neutralizing causes F to pull on the boss on the shifting forks as if a shift in gears were to be made, and the master switch M will also close. Since the neutral button has opened all of the selector switches, all the solenoids have no current in their windings and the gears remain in neutral. A plain view of the neutralizing device and master switch are shown in Fig. 414, and two of the solenoids with their mountings, are shown in Fig. 415. The relative location of the different parts of the complete device are shown in the phantom view in Fig. 416. The solenoids are marked B 1, B 2, B 3 and B 4 and their respective cores are marked C 1, C 2, C 3 and C 4.

In passing from one speed to another the operation is as follows: The selector switch corresponding to the desired speed is pressed and the clutch pedal is rotated all the way forward, which rotates the operating lever K and its shaft upon which the rocker arm I and its mechanism are mounted. The latch H is in engagement with the pawl G of the neutralizing mechanism, and as the operating lever and the rocker arm I are rotated, the latch H presses against the pawl G, causing both of the neutralizing cams F to rotate toward the center as they are engaged through the teeth P. On the central side of the shifting fork D, Fig. 416, is a boss and as the neutralizing cams rotate they press against the boss on whichever side is in engagement, and the shifting fork and the gear with which it is engaged are pulled back to the neutral position before the next shift can be made. As the gear comes into the neutral position, the end of the latch H strikes what is called the knockout pin, which action releases the latch from engagement with the pawl G, and as the operating lever K is moved ahead by the lever pressing down on the clutch pedal, the switch operating pawl L pulls against the switch stem and closes the circuit at the master switch. The gears may be changed by hand, should the battery become exhausted, by inserting an emergency hand lever in the socket S and the gears changed in the usual manner.



The famous Diamond Head, from approaching steamship. This is an extinct volcanic crater and is said to be heavily fortified, protecting the entrance to the harbor

## The Motor Car in Ukulele Land

### Hawaii's Tropical Clime Appeals to the Motorist

By Hi Sibley

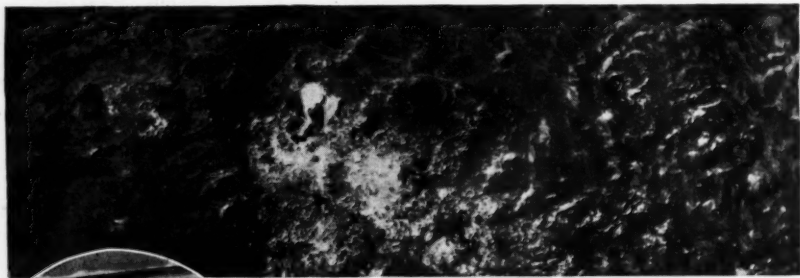
THE motorist who is wearied of the mud and slush of an American winter and yearns to tour in tropic climes will find the Hawaiian Islands most alluring. Aside from the delightful climate of these south Pacific isles, there are very fair roads and no end of points of interest. Honolulu and environs are beautiful; magnificent homes set in vast expanses of velvety lawns, banks and thickets of tropical flowers of the richest hues, fresh as a meadow after a rain, tall, clean cocoanut palms and everywhere are great forest trees with foliage so dense that the sun can scarcely penetrate. After a six-day cruise from San Francisco that rugged sentinel, Diamond Head, the wide clean beaches and the white city of Honolulu are a most welcome sight.

#### "On the Beach at Waikiki"

A popular short run for the motorist is out to the famous Waikiki Beach, about four miles from Honolulu. Here thousands go bathing daily, and here are great numbers of surf board riders. Some of them become so expert that they can ride the crest of a breaker standing up on the board, but the less skilled must content themselves by merely lying flat. Just inside the beach is the great Hotel Moana, where one may dance on the veranda facing the sea, to the thrum-thrum of the ukulele.

Haleiwa Hotel, 31 miles from Honolulu over exceptionally good roads, is another rendezvous for motorists, and here also are a number of seaside attractions. There is a fair road encircling the island of Oahu, on which Honolulu is located, and which follows the seacoast except where it turns in to meet the Schofield Barracks, the largest American military post between Manila and San Francisco. The circuit is 90 miles, and over the macadam, gravel, shell and lava stretches the tourist can easily make the run in four or five hours.

Honolulu boasts some very fine garages and salesrooms, and the latest registration reports 3153 cars in the islands, the greater part of them on the island of Oahu. At present the road around this island is in need of some repair, and President E. W. Farrington, of the Honolulu Automobile Club, is responsible for much effective agitation for good roads and road improvement legislation. In an interview he stated that it was very probable that the next



Native boys diving for coins tossed from ship in harbor. These Hawaiians will climb to highest lifeboats and dive to water 70 ft. below



Katherine Stinson, the aviatrix, comes on board laden with gifts from friends in Honolulu



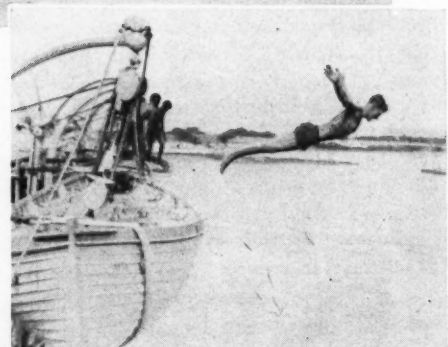
Drive between Honolulu and Waikiki Beach



The city of Honolulu as seen from shipboard in the bay

local legislature would grant a large appropriation for this work, and that in the next eighteen months nearly a million dollars would be applied to road improvement. Half of this amount would be raised from bonds, and the remainder by land valuation tax, motor car tax and personal subscription.

One sees quite a number of motor trucks of all types and capacities, and the motor tractor is doing good work in the sugar cane plantations.



Diving from lifeboat into the bay to recover coins thrown into the water by passengers aboard ship



# Defying the Chills of Winter

**C**OLD has no chill nor rain, effect, when the fairer sex does its Christmas shopping and war work through the medium of a motor car. For what with the many heating devices that cars are heir to nowadays and with the experience of the owner that gives to his car those little devices that aid in bringing comfort it is just about as comfortable to venture forth these days as it is to stay at home and stick by the hearthside—or radiator.

It used to be, you know, that when you went to visit grandfather and grandmother at Thanksgiving and Christmas, they met you with the old bobsled most often, with buffalo robes and blankets and hot footstone and everything like that. Well, it is all different now. More likely than not you are met these days by a closed car or a touring car with snug fighting top, heated with one of the various devices now available for bringing summer comfort to the winter car.

Of course, the sedan and other closed cars do much to make the passenger feel fully justified in considering the car part of the regular schedule of going down to the Red Cross shop, the first aid class or the food demonstration, not to mention about the annual job of helping spread the Christmas spirit.

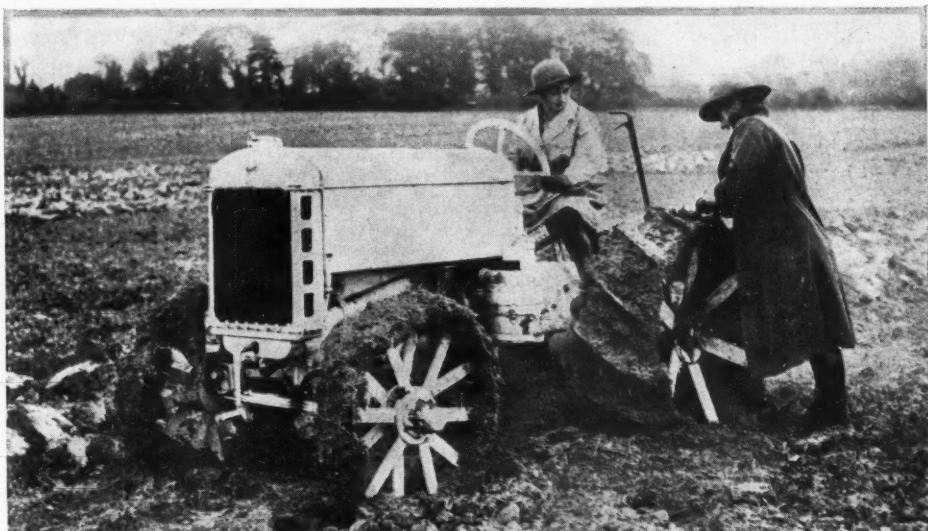
Among the warming devices are the radiator, now as much at home in the car as at home; the heater that burns smokeless fuel of charcoal; the heater that works electrically; the foot warmer that fits just underneath the motor robe; the hand warmer on the steering wheel to ward off chilled fingers for the driver; the portable hand and foot warmers, called most often Japanese hand and foot warmers.

## Heats Entire Car

As a rule the heater that utilizes the exhaust is used when the entire car is to be heated, though the electrical appliances do this also. No matter how cold it is outside, the inside can be kept comfortable as long as the engine is running. The process not only routs cold weather from within but uses energy hitherto recognized as wasted. The exhaust is passed through a heating pipe into the tonneau in some types. No odor of gas escapes, as the pipe merely conducts the gas to the tonneau, whence it passes out beneath the floor. A regulating attachment may be provided. Some of the heaters of this type are used as footrests as well and so need not be removed when cold weather is over.

An electric heater and footrest is charged with heat, one might say, by wires that lead from the storage battery. When the heater has reached a high enough temperature for comfort, the current can be switched off until the heat dies down. The electrical steering wheel heater is a real blessing for the driver. It is operated by the storage battery and attached to the wheel. One type conforms to the shape of the wheel; another furnishes a grip's breadth of warmth.

Do not overlook in the midst of these comforts the maker has so accommodatingly supplied the older comforts other car owners have tried out, for even with the new



English women are tilling the land now so many men are gone. A thousand are needed to run tractors alone, it is said

heaters there is need for them. You will remember perhaps the suggestion that you wrap strips of felt or broadcloth tightly around the steering wheel and glue them with rubber cement to eliminate the chill of metal.

Then there is the car owner who swears by the hot-water bottle. One woman uses it with a less utilitarian cover as a hand warmer for the longer drive. Another uses it as a cure-all for a balky engine. A half-four application is advised. Another contends that the hot water can be retained without replenishing for 10 or even 12 hr., when extra cover is supplied and it can be replenished, if necessary, by the water in the radiator, which becomes heated in the course of a run of considerable length, making it practically perpetual.

Then there is the motor robe. Snaps and dees from the harness shop, with a leather strap, work wonders with it. Fasten the dee, a piece of metal in the shape of the letter D, by a rivet or brad to the back of the seat, then the snap to one end of the leather strap, the other end of which is sewed to the robe, if it is cloth, or riveted, if it is fur. The snap fastens to the dee when the robe is adjusted, holding all safely in place.

## Save the Wheat

**M**AKE it a principle, the Food Administration advises, to increase the use of cornmeal to the maximum. Pound for pounds, the energy value of cornmeal is equivalent to that of wheat flour. The cost is less. Every time cornmeal is used where wheat products were used before you are helping win the war.

Have cornmeal mush for breakfast; add figs, dates or other fruit for variety; serve fried mush; use cornmeal in quick breads, yeast breads, desserts. The breads are light, palatable and capable of frequent use in the weekly dietary. Likewise, make

the maximum use of oatmeal or rolled oats. Omit all wheat breakfast cereals. Use oatmeal or rolled oats, and obtain variety through fruits. Use rolled oats to conserve one-fourth the wheat in making muffins, rolls and yeast-raised bread.

Here are two recipes for cornmeal griddle cakes or waffles for breakfast, tried and found unwanting. In addition one each for cornmeal and oatmeal muffins is given. These are different from those already given in these columns.

### Cornmeal Griddle Cakes or Waffles, I

- 1 cup milk (8 oz.).
- $\frac{3}{4}$  cup flour (3 oz.).
- $\frac{3}{4}$  cup cornmeal (3 $\frac{3}{4}$  oz.).
- 2 tsp. baking powder ( $\frac{1}{4}$  oz.).
- $\frac{1}{2}$  tsp. salt ( $\frac{1}{8}$  oz.).
- 1 egg (2 oz.).

Add beaten egg to milk and add to dry materials, well mixed.

### Cornmeal Griddle Cakes or Waffles, II

- 1 cup sour milk (8 oz.).
- $\frac{3}{4}$  cup flour (3 oz.).
- $\frac{3}{4}$  cup cornmeal (3 $\frac{3}{4}$  oz.).
- $\frac{1}{2}$  tsp. soda ( $\frac{1}{14}$  oz.).
- 1 tsp. baking powder ( $\frac{1}{8}$  oz.).
- $\frac{1}{2}$  tsp. salt ( $\frac{1}{8}$  oz.).
- 1 egg (2 oz.).

### Cornmeal Muffins, I

- 1 cup milk or water (8 oz.).
- 1 $\frac{1}{4}$  cups flour (1 $\frac{1}{2}$  oz.).
- $\frac{3}{4}$  cup cornmeal (3 $\frac{3}{4}$  oz.).
- 1 to 2 tbsp. fat ( $\frac{1}{2}$ -1 oz.).
- 1 to 2 tbsp. sugar ( $\frac{1}{2}$ -1 oz.).
- 1 egg (2 oz.).
- 4 tsp. baking powder ( $\frac{1}{2}$  oz.).
- $\frac{1}{2}$  tsp. salt ( $\frac{1}{8}$  oz.).

Method I. Mix milk, egg, and melted fat, and add dry ingredients well mixed.

Method II. Scald cornmeal with the hot milk; add egg, melted fat and dry ingredients.

### Oatmeal Muffins, II

- 1 $\frac{1}{2}$  cups milk (12 oz.).
- 2 eggs (4 oz.).
- 2 tbsp. fat (1 oz.).
- 2 tbsp. sugar (1 oz.).
- 1 tsp. salt ( $\frac{1}{2}$  oz.).
- 2 cups rolled oats (5 $\frac{1}{2}$  oz.).
- 1 cup flour (4 oz.).
- 4 tsp. baking powder (1 oz.).

Pour milk over oats and let soak half an hour. Add eggs and melted fat. Add to dry ingredients, which have been sifted together. Bake 25 to 30 min. This makes ten or twelve muffins.

# The Readers' Clearing House

## Valve Timing

### Limits of Valve Timing

**Q**—I have an English-built four-cylinder car, cylinders 4 in. in diameter by 5½ in. stroke. The old timing is practically that shown in the diagram on page 36 of *MOTOR AGE* for Sept. 13. If I changed the timing to correspond with the diagram inclosed, what will be the effect on the engine? With the gearing and tires now in use 1500 r.p.m. of the engine on top gear gives about 43 m.p.h.—J. S. Badger, Brisbane, Australia.

In Fig. 3 the negative overlap is abnormal, that is the inlet valve opens 24 deg. before the exhaust valve closes. This means that some of the incoming charge will be lost through the open exhaust valve resulting in increased fuel consumption. In some tests made on a four-cylinder Renault engine in 1909 to determine the effect of varying the inlet timing on the power output and fuel economy, the Automobile Club of France found that if the inlet valve began to open 15 deg. after top center and closed 60 deg. after lower center the best results were obtained. It is impossible to state definitely what the valve timing for an engine should be as this depends upon the inertia of the gases, the quality of the fuel, the location and size of the valves and valve passages, the displacement of the cylinder, and the speed of rotation. The range of timing in motor car engines is approximately as follows; inlet opens from 0 to 15 deg. after upper center, inlet closes from 20 to 55 deg. after lower center, exhaust opens from 35 to 65 deg. before lower center and exhaust closes from 0 to 15 deg. after upper center.

Engines designed in accordance with the same standards of engineering will have about the same valve timing regardless of their cylinder dimensions. For instance, a well known engine builder uses

a valve timing of exhaust closing and inlet opening 10 deg. after upper center, exhaust opening 50 deg. before lower centers and inlet closing 50 deg. after lower center for both stock and racing car engines. It is probable that the original valve timing would give better results than the suggested timing.

## Experience Meeting



### What Was Your Experience With Auxiliary Air Devices?

**T**HERE are many devices on the market for attachment to the intake manifold and designed to furnish extra air to the engine when it is running.

Surely many of you have tried out these auxiliary air devices and have kept track of just what difference it made in the running of the engine, cooling and consumption of fuel. You who have this information can help others who may be thinking of installing such apparatus, by giving your experience with it. In writing, tell how you attached the device and on what make of car it was used. Tell also how many miles per gallon you obtained before installing the device and what the increase was after you made the change. Would you install another device like this if you had a car not so fitted? If not, what is the reason?

This will be used with your signature or not as you prefer, but in every case the letter must carry full name and address.

## Miscellaneous

### Steam Car Information

**Q**—Is the new Doble-Detroit steam car made by the same people as the Doble steam car which was announced last year? What is the price of this car and what is its weight?—Edmund B. Morris, Albia, Iowa.

The Doble-Detroit is made by the Doble-Detroit Steam Motors Co., Detroit, Mich. This car weighs 3500 lb. The price of this car will appear in the Jan. 3rd issue of *MOTOR AGE*.

### Gear Ratio on Various Cars

**Q**—What is the gear ratio on low of the Hupmobile, Chalmers, Buick light six and Oakland?

**2**—Is there any car geared lower than 16 to 1 on low gear? If so, I should like the names of such cars.—Keller Brothers, Foster, Neb.

**1**—The low gear ratios of these cars are as follows: Hupmobile 13.9 to 1, Chalmers 16.05 to 1, Buick light six, 14.44 to 1, Oakland 13.9 to 1.

**2**—The total low gear reduction of practically all stock cars is about 14 to 1 although there are some exceptions as noted in the answer to the first question. The 1914 Herreshoff was geared 18 to 1 on low gear.

### Automatic Garage Doors

**Q**—Show diagram for double swinging doors which can be opened and closed from the inside of an adjacent office.—James Brown, Chicago.

Each door is provided with a traveler A, as shown in Fig. 4, which is at least 1 in. above the top of door and about 2 in. out from its face. On each traveler is a sliding device B 1, which has a link swinging freely upon it. Over suitable pulleys and through a hole in the office wall a small cable runs to a reel D. The cable is continuous with only a few turns around the reel so that when the crank is turned one way or the other the cable runs in a corresponding direction. It is plain that if the cable ends are attached to B 1 which in turn is mounted on the traveler A, the door will be swung as the reel is turned.

By making the reel large enough to hold two cables both doors may be operated at the same time by one crank.

### Spark Plug Oiling

Island, Ky.—Editor *MOTOR AGE*—I have read with interest in *MOTOR AGE*, issue of Nov. 15, the article from Clayton Smith of Iowa City, Iowa, but I do not agree with him when he says the trouble with the spark plug oiling up in Ford front cylinder or fouling is caused from a too rich mixture, as I shall try to show. Mr. Smith says a Ford engine equipped with a Schebler-Ford or a Stromberg-Ford will remedy the trouble. We have two new 1917 Ford touring cars. If the front cylinder of these two machines had been designed for an oil pump, they could not be improved on. I removed the cylinder head from one of them which had given considerable trouble. The first or front cylinder was badly carbonized. I cleaned the carbon out and ground the valve, washed out the crankcase with Rasone, put in 3

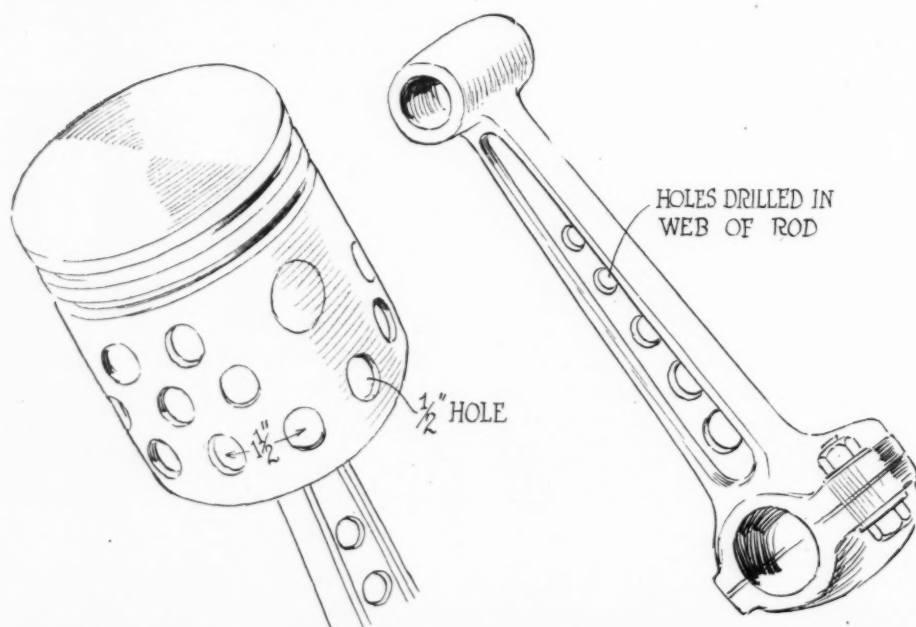


Fig. 1.—Method for reducing weight of piston and connecting rod



qt. of oil, put on four new Champion spark plugs and then put on a Stromberg-Ford carbureter. The car ran well for about 5 miles. Then I had the same trouble with the oily plug in the front cylinder. I could see no difference in the regular Kingston carbureter which came with the car and the Stromberg special. The Stromberg is a good carbureter, but it will not cure an oily plug in the front cylinder of a Ford.

The sure remedy is to drill or file a small hole in the bottom of the oil tube at the second cylinder so the front cylinder will not get so much oil and the trouble will be cured. I have seen this done a number of times. The car on which this test was made had not been driven over 800 miles and all the cylinders had 60 lb. compression, and was never driven over 15 m.p.h.—Guy A. Thornsberry.

#### Pyrene Extinguisher Data

Q.—Do Pyrene fire extinguishers, when not used for long periods, ever get in a condition in which they will not work? What attention is necessary to keep them in working order when they are unused for long periods?—W. A. Stephenson, Findlay, Ohio.

Pyrene needs no maintenance and is ready for any emergency. It will not corrode and the liquid will last until used. This, of course, is the guarantee only when the genuine Pyrene liquid is used in the extinguisher. If a substitute liquid is put into the extinguisher after it is empty, it often causes corrosion.

#### Shorter Inlet Manifold

Q.—Would it effect the distribution of gasoline to the engine if I shorten the intake manifold and hang carbureter higher to help engine start easier in cold weather? I have a Miller carbureter. Would it help the engine, or would it effect the present engine power? I have a Maxwell car.—James White, Spokane, Wash.

Shortening the inlet manifold will not affect the power output of the engine and will aid materially in starting in cold weather. If the engine is not equipped with a device for pre-heating the air before entering the carbureter, it would be advisable to attach one, as these can be secured for a nominal sum. With pre-heated air and a short manifold, condensation in the manifold is reduced to a minimum.

#### Tuning Car for Speed

Q.—How can I make a 1912 Hupmobile 20 roadster fast? I can only go about 30 m.p.h. It is equipped with a Schebler carbureter and an Eisemann high tension magneto.—E. A. Solecki, South Chicago, Ill.

The speed of this car can be slightly increased by lightening the reciprocating parts, retiming magneto, reseating valves, and possibly changing the gear ratio.

In Fig. 1 is shown a method for reducing the weight of the piston and connecting rod. The piston should be drilled as shown and in drilling the connecting rods extreme care should be exercised in order not to weaken the rods too much. It would be best to drill the holes about  $\frac{3}{8}$  in. and not to drill too near the lower end of the rod as this end has the greatest strain upon it. If it is necessary to fit new rings we would suggest that one of the good forms of patented rings be mounted in the upper ring slot and the others may be of the conventional type, but bear in mind that two well-fitted rings are worth three poorly fitted ones.

The magneto should be timed so that the breaker points will just begin to open

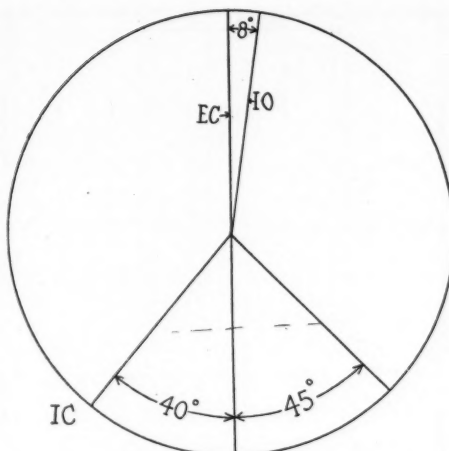


Fig. 2—Valve timing of Herschell-Spillman

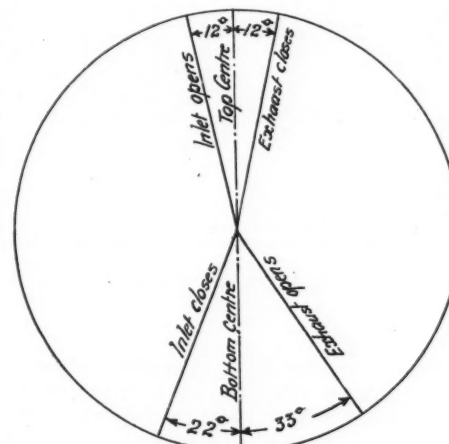


Fig. 3—Limits of valve timing

when the piston is on its upper dead center on the power stroke, with the breaker mechanism in its fully retarded position.

The valves should be reseated and re-ground, being certain that the stems are true and do not bind in the valve guides. Also examine the valve springs and compare them with each other so as to eliminate the possibility of weak springs causing any trouble.

We do not believe it advisable to change the gear ratio, at least not until the work

on the engine has been completed and the car given a trial after the engine has been thoroughly limbered up.

#### Lubrication of Clutch

Q.—Does the engine oil, that is, the crankcase oil, lubricate the clutch? I had the oil pan off and on the rear end of crankcase pan ahead of where the offset is placed for the inclosure of flywheel; there is a hole about  $\frac{1}{8}$  in. diameter. Is this to allow the crankcase oil to get in the clutch housing to lubricate the clutch? It seems to me this is not a good arrangement, because, as the clutch plates wear, the fine particles will mix with the motor oil and may do some damage to the bearings. Could I not plug up this communicating hole and oil clutch separately, as I could then mix the oil in the clutch housing with kerosene in cold weather and keep the plates from sticking on a cold morning?—M. Rix, Oak Park, Ill.

The clutch is lubricated automatically from the engine and requires no attention except when changing the oil in the crankcase which according to the manufacturer should be changed every 1000 miles. At this time the crankcase and clutch compartment can be washed out with kerosene and thus prevent the possibility of any minute particles of metal collecting in the case and causing damage to the engine. We would suggest that the maker's oiling system remain as is and that their direction regarding care of it be carried out.

#### Cannot Find Knock in Oakland

Q.—My Oakland 34, which has been driven about 3000 miles, has recently developed a bad knock, for which I can find no cause, as wrist-pins, connecting rods, etc., seem properly adjusted. I am told that valve-in-head cars all have this trouble, and that the engine is naturally noisy. Is this true, or is there some remedy for this knock?—R. S. Coad, Charlotte Hill, Md.

This knock may be due to one of several causes. If the knock does not develop until a car speed of greater than 20 m.p.h. is reached it is probably due to a loose center or rear main bearing and it will be necessary to remove an equal number of shims from each side of either of the bearings in order to secure the proper adjustment to prevent the knock. An exhaust valve that sticks occasionally when the engine warms up also will cause a peculiar noise, although it will not be as deep in tone or as heavy as the main bearing knock. If the valve mechanism is thoroughly oiled with lubricating oil and the valve stems flooded with a bath of kerosene this should temporarily afford relief

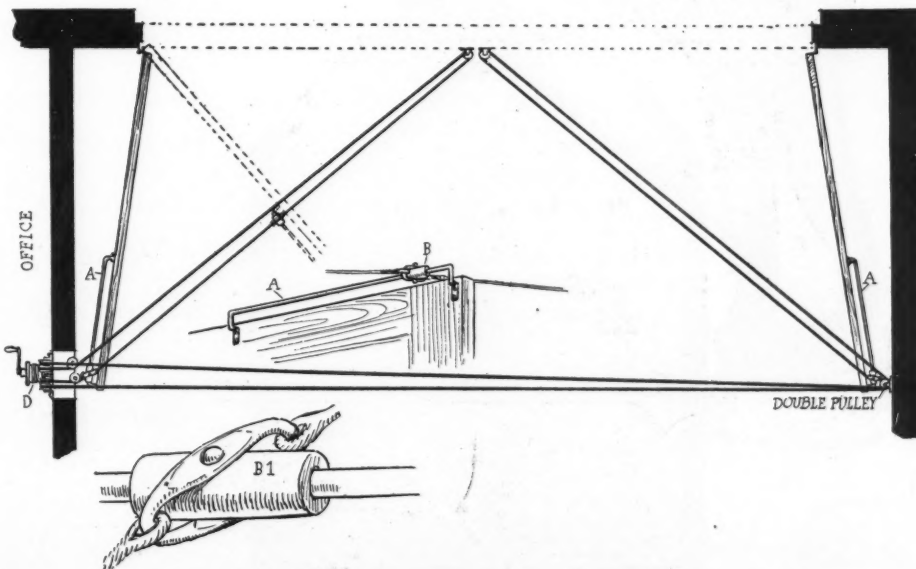


Fig. 4—Diagram for double swinging garage doors opened from inside office

from sticking valves. This noise may also be due to excessive play in the timing gears especially the camshaft gear. If the fan is held stationary it will act as a brake on the gears and prevent them from oscillating back and forth against each other and thus prove if the noise is in the timing gears.

## Plan for One-Story Garage

Q.—Please publish a plan for a garage with shop, office, a small stock room and everything that may be of value in a first class garage.—Bacon Garage, Cando, N. D.

There are two designs shown in Figs. 5 and 6 which are for corner locations. One of these is designed for a front entrance. The objection to this is that it limits the size of the sales and accessory rooms while the other design with the side entrance does not. The fundamental difference between the two designs is that one has the advantage of having the whole front for display purposes and the disadvantage of having side entrance to the garage while the other has front entrance to the garage and a limited size to the sales room. Both of these have about the same total car capacity.

## Mysterious Knock In Maxwell

Q.—The engine of my 1915 Maxwell has had a loud metallic tap in it since the car was new and it has persisted in spite of every measure tried. It is only heard after the engine is thoroughly warmed up and seems to occur once every revolution. The knock is heard only when engine is pulling, not when it is running free or car going downhill. Retarding the spark only slightly diminishes the noise, and cleaning out carbon, tightening bearings and different grades of oils have had no effect on it. Wristpins are tight, compression is good, valves and ignition are correctly timed, water circulation is good and the performance of the car in general is good. Gasoline mileage is very good, too, as much as 27 miles to the gallon sometimes.—H. C. Schutte, Minneapolis, Minn.

If as you state the ignition is correctly timed so that the possibility of spark knock is eliminated, the knock may be due to a loose main bearing, an undersize pis-

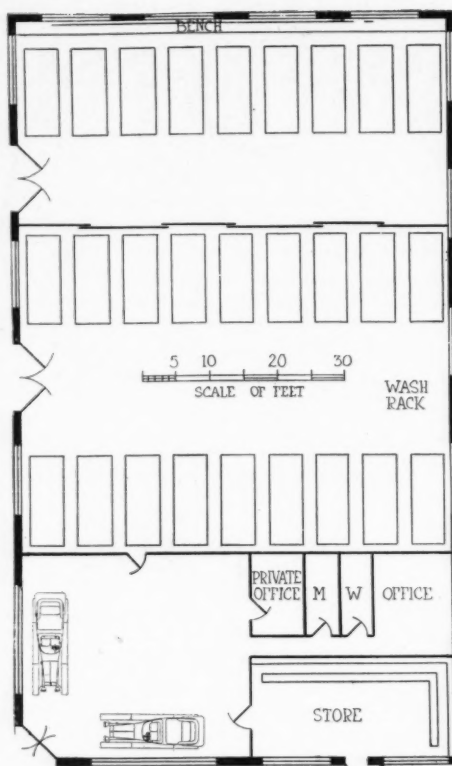


Fig. 5—Plan for garage with front entrance

ton or to timing gears. A sprung crankshaft will cause a mean bearing to loosen up and knock a short time after it has been tightened up. This will be noticed as a heavy dull knock when the engine is working under a heavy load. A piston slap will be a knock of less intensity than the main bearing and will be most noticeable when the engine is warmed up. If it is a piston slap it can be proved by pouring a small amount of 600 W steam engine oil

into one cylinder at a time and then running the engine and notice if the noise still exists. The heavy oil will act as a cushion and prevent the piston from slapping, providing it is undersize, at least for a time long enough for an observation. Thus by testing each cylinder it can be proved whether or not it is a piston that is causing the trouble. If the noise is due to timing gears, it can be determined by holding the fan while the engine is running, it acting as a brake and preventing the gears from whipping providing there is any backlash present. This backlash can also be noticed by trying the play in the pump shaft by hand.

## Wants Garage Plan

Q.—Show a plan for a modern garage about 50 by 140 ft. with salesroom, accessory store and repair shop.—F. C. Calkins, Ponca City, Okla.

Two layouts for a garage of approximately this size are shown and discussed in this issue in the answer to the inquiry of the Bacon Garage.

## Rear Axle Is Noisy

Q.—The rear axle of my 1915 Maxwell has always been very noisy. As there is no adjustment of pinion and ring gear provided on this car, the insertion of thin washers behind pinion and drive gear was tried, but the noise is still very annoying at 20 m.p.h., but not so much so above or below this speed.—H. C. Schutte, Minneapolis, Minn.

The differential carrier to which the ring gear is attached should have no side play and yet be free in its mounting. Its position should be so that the pinion is fully meshed with a small amount of play between the teeth. The character of the noise at 20 m.p.h. will determine the cause more or less accurately. If the noise is intermittent and sounds like the gear was out of round, it may be due to the gear itself or to improper mounting on the differential carrier. A steady sound is due to the adjustment being either too tight or too free. If this noise is more prominent when rounding corners, it indicates that there is side play in the differential carrier.

## Wants to Lengthen Ford Frame

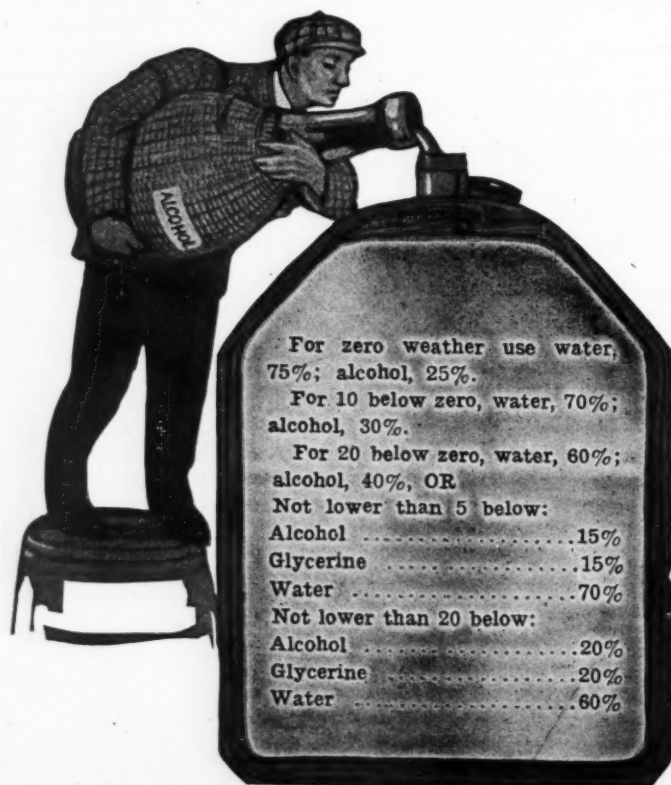
Q.—Is it practicable to lengthen Ford frame 12 in.?

2—Will Peugeot type cylinder head increase speed of Ford materially with no other alteration in engine?

3—Can Motor AGE furnish more complete drawings of sporting type speedster by Kenworthy shown on page 39 of issue of May 31, 1917?

4—What gage steel should be used for speedster bodies?—Lewis Darling, Fulton, Mo.

1—There is no reason why the Ford frame could not be lengthened 8 in. without any ill effects, if you mean to extend the frame over the rear of the car. If you mean to lengthen the frame by cutting it in two and splicing in a piece, it means much more work. For example, to keep the rear spring fastened to the rear frame cross members as it normally is, would mean that you would have to lengthen the drive shaft, drive shaft housing, radius rods, etc. This means a whole lot of work and it is our opinion that you would be better off to leave the frame and wheelbase the same length as it is now and simply give the body more overhang in the rear if you want it longer. For speedsters, especially, the present wheelbase is satisfactory and there have been many good-looking and



Or  
Use One  
of the  
Proprietary  
Solutions  
Which  
Motor Age  
Has  
Described

For zero weather use water,  
75%; alcohol, 25%.  
For 10 below zero, water, 70%;  
alcohol, 30%.  
For 20 below zero, water, 60%;  
alcohol, 40%, OR  
Not lower than 5 below:  
Alcohol .....15%  
Glycerine .....15%  
Water .....70%  
Not lower than 20 below:  
Alcohol .....20%  
Glycerine .....20%  
Water .....60%



comfortable speedster bodies designed and built to take the conventional Ford frame.

2—Yes. It gives the gases a much quicker chance to get in and out of the combustion chamber, which is very essential in high-speed engines. For fast work, however, it is better to fit a special camshaft such as are advertised in **MOTOR AGE** for Ford cars. These camshafts are provided with cams that give the valves a longer opening and quicker closing.

3—**MOTOR AGE** does not attempt to go into details concerning the construction and actual dimensions of the speedster types illustrated. We aim to give the general appearance of the body as it would look when finished. Usually the builder has a few ideas of his own that he would like to incorporate in the design and hence we leave such details to the builder.

4—The steel generally used for this purpose is either 22 or 24 gage. We advise you to use the former as it is a little heavier than the 24 gage and yet bends readily and can be worked to shape quite easily. It can be obtained in sheets 120 in. long and 36 in. wide.

### What About This?

Salina, Kan.—Editor **MOTOR AGE**—I notice you are recommending several things to help start engines in cold weather. Hot water on the manifold is the best thing I have found except a can of solid alcohol. Take the lid off the can, apply match, then hold can under manifold about a minute, then shut off blaze by putting lid back on can and off the car goes when you crank it.

I carry a piece of galvanized iron to set can on rather than hold it in my hand. This or some kindred mixture is kept by nearly every hardware store.—J. Earl Wyatt.

## The Electric System

### Wiring of 1916 Regal

Q.—Show ammeter wiring and connections for 1916 Regal, model E, light four. It has a single-unit Dyneto motor-generator with one switch for use.—C. W. Kemper, Exeter, Mo.

The wiring diagram is illustrated in Fig. 8.

### Emergency Lights for Overland

Q.—Show diagram illustrating method of adding a dry battery system to be used in connection with present Auto-lite system on Overland 75B, 1917, for emergency use when storage battery gives out for any reason.—J. M. Roan, Edenwold, Tenn.

This is shown in Fig. 7 and the apparatus should be connected up only in case of emergency. If for some reason the battery fails, then in order to prevent burning out the generator the two generator terminals should be connected together to render the generator inoperative.

### Generator Does Not Charge

Q.—I have an Overland, model 5, 1917, equipped with the Auto-lite system of lighting and starting. The generator, according to the ammeter on dash, only puts out about 8 amp. at highest speed, which does not keep up the battery when starter is used for every start. Is there any way to increase the output?—Ralph L. York, North Powder, Ore.

The reduction in output is probably due to a dirty commutator and should be cleaned with No. 00 sandpaper. To clean the commutator remove the end cover to

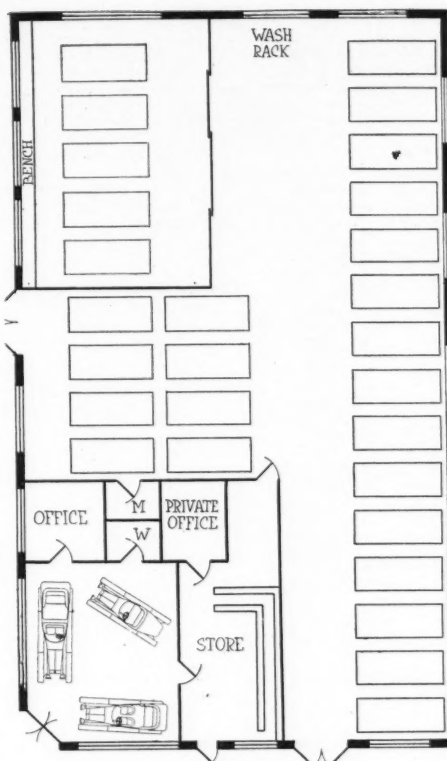


Fig. 6—Plan for garage with side entrance, including office, showrooms, etc., in one story

the generator. Next remove one of the brushes and using a small wood paddle about  $\frac{1}{8}$  in. thick and about one-half the width of the brush guide with the sand-

paper wrapped over the end of it, clean the commutator through the brush guide when the generator is revolving at a fair rate of speed. The output of the generator should be about 14 amp. at 20 m.p.h. and 10 amp. at 15 m.p.h.

After cleaning the commutator blow all the dirt out of the commutator end of the generator and if it does not yet charge then examine all connections and make sure that same are tight. If the generator still does not charge normal examine battery terminals and make sure that they are clean, free from sulphate, and tight in the bus bar.

### Recharging Ford Magneto

Q.—How can I recharge a Ford magneto from a 30-volt sixteen-cell battery?—Keller Brothers, Foster, Neb.

The required voltage for recharging the Ford magneto is about 30 volts. To prepare the magneto, first disconnect the wire at A, Fig. 9, which leads from the magneto terminal on the transmission cover to the coil on the dash. Next remove the transmission cover B, so the magneto will be in sight. Locate the brass studs on the rim of the flywheel which holds the magnets in place, and turn the engine over slowly until one of these brass studs is in line with an imaginary line drawn about 1 in. or so from the magneto terminal, to the left of the latter and paralleling the frame. Another method is to place a small compass on the transmission cover about 1 in. from and to the left of the magneto terminal, at the same time turning the engine slowly until the needle of the instrument is parallel

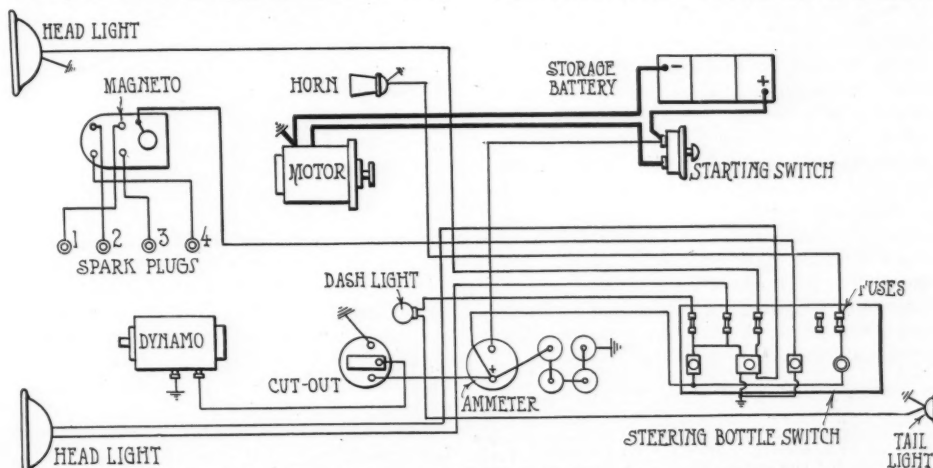


Fig. 7—Wiring diagram for apparatus for emergency lights on Overland

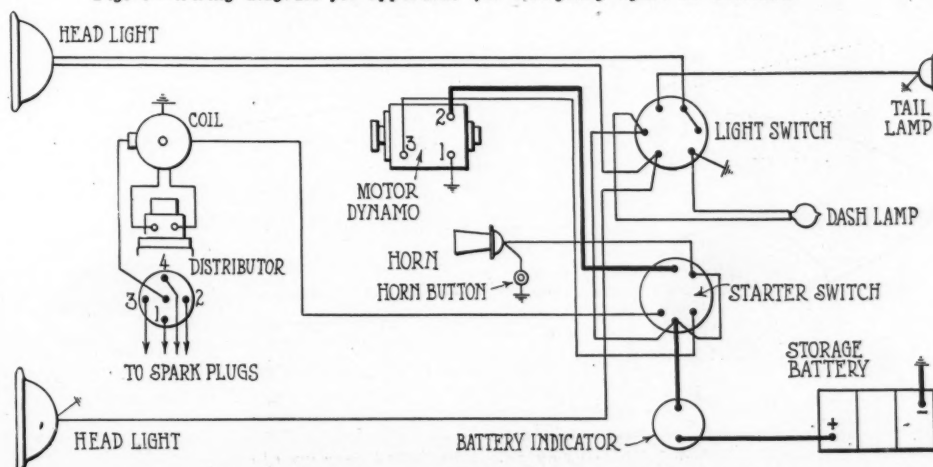


Fig. 8—Wiring diagram for 1916 Regal light four model E

to the engine. The north pole of the needle should point toward the engine when in this position. Connect a wire from the positive terminal of the batteries to the magneto terminal on the engine, as shown by C. Next connect a wire from the negative terminal on the battery, and make and break the circuit by striking the free end of the wire on some metal part of the engine. Permanent connection should not be made but only thirty or so momentary contacts, which, it is said, will recharge the magnets much more satisfactorily than if a permanent contact is made.

## Battery Leaks Electrolyte

Q.—I have a Gould storage battery in my Overland, model 75, 1917, which is not the one that came with the car, owing to a mistake at garage when it was being overhauled. The plates do not look damaged, but the battery looks as if it had received rough treatment; the box is broken and the back cell leaks electrolyte. Can this be fixed satisfactorily and cheaply enough to make it worth while?—Ralph L. York, North Powder, Ore.

It is difficult to state whether it would be best to have the battery repaired or to trade it in on the adjustment basis for a new battery. If you are in position to secure an estimate on repairing the battery do so and then compare it with the exchange price of a new battery. Repaired batteries, especially after they are a year old are uncertain as to their lasting qualities and one may last a year or it may last only a month.

## Ammeter on Oakland 36

Q.—Show diagram of how to connect in an ammeter on an Oakland 36, using a Delco Junior outfit.—A. D. Rittersbacher, Bartlesville, Okla.

To connect the ammeter on this model, the strap connecting the terminals 1 and 2, in Fig. 11, of the motor-generator must be removed. On some of the machines this strap is on the inside of the frame, as shown at B making it necessary to remove the motor-generator from the car and disassemble it in order to cut the strap. On some other cars the strap is on the outside, as at A. In this case it can be cut with a hacksaw, without removing the motor generator from the car. After this strap has been cut, a tap is made on the wire from No. 2 terminal to the positive terminal of the ammeter, and a wire run from the other terminal of the ammeter to No. 1 terminal.

## No Ignition on 1916 Hupmobile

Q.—I have a 1916 Hupmobile using the Bijur electric system. Sometimes it is impossible to get an ignition current until I revolve the armature of the starter and the brushes come on other commutator segments. Sometimes it is necessary to clean the brushes. The

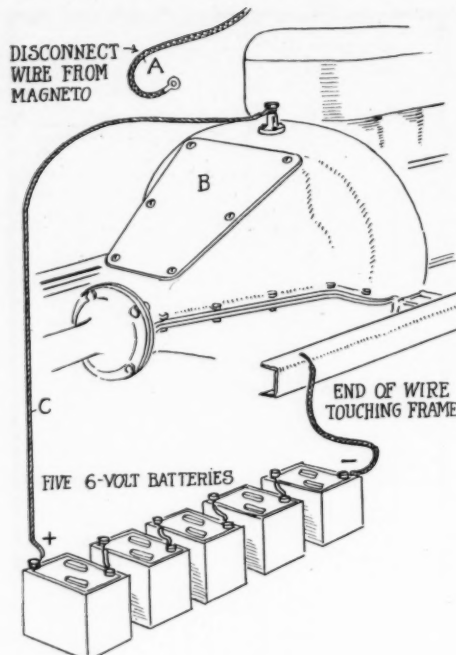


Fig. 9—Apparatus for recharging Ford magnetos

generator has been removed from the car, so the only service demanded of the battery is of igniting or lighting. What action has the starter on the lighting and ignition currents?

2.—If I cut the starter out of these circuits, must I put a resistance on either one? If so, how many ohms?—Fred Meiswanger, Walla Walla, Wash.

As is shown by the wiring diagram in Fig. 12, the ignition system is separate from the rest of the electrical system except for the joint connection at the negative terminal of the starting motor, which due to a loose connection may be the cause of your trouble. The starting motor circuit is independent from the others, it being direct from the battery with a switch in the positive line. The positive terminal of the battery is ground at one of the terminals on the starting-motor switch and it may be a poor ground connection at this point that is the cause of your trouble. If neither of these prove to be the trouble, examine carefully all of the connections in the ignition system and make sure that they are tight and that none of the wires have partially broken or unsoldered connections especially in the low-tension circuits.

2.—Removing the starting motor from the circuit will not affect it providing the three connections at the negative terminal of the starting motor remain intact and

are not permitted to short-circuit against the frame or other metal part.

## Ford Magneto for Charging

Q.—Where can I get a transformer for the Ford magneto or generator. I am using an Atwater-Kent ignition system and should like to use the magneto for charging my battery.—F. W. Smith, Brooklyn, Wis.

There is a rectifier made for Ford cars which changes the surplus alternating-current to direct. Enough current is saved, it is said, to keep a 6-volt battery charged. All the current is stored, after being rectified for service when wanted. Thus the lights can be turned on even if the engine is not running. The device is installed at the front of the engine and the usual Ford timer replaced by an elevated timer in the instrument. It is also claimed that with this device there is better firing at low engine speeds and steady bright lights. This device is made by the Consolidated Utilities Corp., Chicago, and we believe the price is \$17.50 for the rectifier only and \$29.50 for battery and rectifier.

## Engines

### King Engine Details

Q.—How can I take up the slack in timing gear chains on my 1916 model D King eight?—M. Rix, Oak Park, Ill.

The timing gear drive chains should be checked for wear after the first 5000 miles of service and once a season thereafter. In order to reach the timing gear chains the fan and gearcase cover must be removed. The camshaft chain is at proper tension when it does not sag between the sprockets and can be pushed in about 1/8 in. at the middle of the longest span. To tighten the timing gear chain loosen the nuts holding the idler sprocket and move it away from the center of the engine toward the frame.

The generator driving chain can be tightened without removing the case cover. Loosen the four screws under the generator bracket and slide the generator away from the engine towards the frame. This chain is at proper tension when it does not sag between the sprockets and can be pushed in about 3/8 in. at the middle.

### 1913 Hupmobile Horsepower

Q.—What is the bore and stroke and the horsepower of a 1913 Hupmobile engine?—W. Thornton Mays, Marshall, Tex.

The bore is 3 3/4 in. and the stroke 5 1/2 in. The N. A. C. C. rating is 16.9 hp.

### Ford Special Misses

Q.—I have a 1912 Ford touring car, bored to 3 3/8. It has aluminum pistons which fit with .015 in. clearance. Valve ports have been bored out 1/4 in. It has a large 2 1/2 in. exhaust manifold, Atwater-Kent ignition, stock camshaft, stock intake manifold, fitted with 1 1/2 in. Holley carburetor. The car runs and hits perfectly at 30 m.p.h., but above that it misses. This car has had five different carburetors, three different sets of Atwater-Kent systems and the valve springs have been given greater tension. The camshaft has been set ahead two teeth, the piston and rods in this car were weighed to a fraction of an ounce. On account of the vibration, a pair of counterbalances were installed, but the vibration remains the same. Is the compression too great with the engine running at high speed?—R. H. Emery, Council Bluffs, Iowa.

We would suggest that the timing of this engine be returned to normal, as it will give the best results when using a stock camshaft. This timing is as follows: The inlet valve opens 1/16 in piston

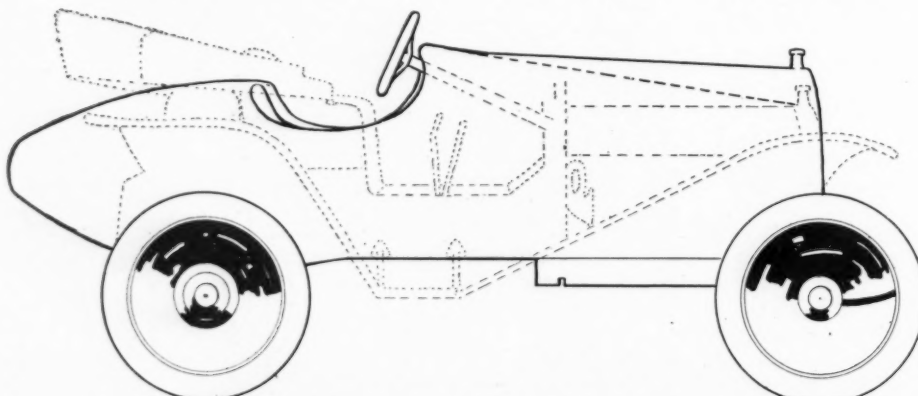


Fig. 10—Reconstructed Hupmobile. The dotted lines are of original body





travel past upper dead center and closes  $\frac{1}{8}$  in. past lower dead center. The exhaust valve opens  $\frac{1}{8}$  in. before lower dead center and closes on upper dead center. The piston on a standard Ford is  $\frac{1}{8}$  in. above cylinder casting when on upper dead center.

It is possible that the engine missing at high speeds may be due to too rich a mixture. Regarding the size of the carbureter we would suggest that you use a  $1\frac{1}{4}$  in. instead of a  $1\frac{1}{2}$  in. as this is larger than is necessary for an engine of its displacement. The large carbureter may cause loading at fairly high speed and thus be responsible for the missing.

It may be that in increasing the bore of the cylinders a minute sand hole was opened up in the cylinder block and at high speed the temperature becomes high enough to open this hole and admit sufficient water to cause missing. If this were true oil will get into the cooling water and collect at the top of the radiator.

#### Gnome Engine Details

Q.—How is the gasoline delivered from the tanks to the engine on the Gnome rotary airplane engines? What kind of a connection is made in the pipe line so as to enable the cylinders to revolve?—Edmund B. Morris, Albia, Iowa.

In the Gnome revolving cylinder engine, the carbureter is connected to the hollow stationary crankshaft by a short straight manifold which feeds the gas through the hollow crankshaft into the crankcase of the engine. The gas is admitted into the cylinder through an automatic valve in the head of the piston.

#### Loss of Compression

Q.—What causes the last or fourth cylinder on a Hupmobile 20 roadster to lose its compression? I have just had the valve ground and it seems the engine fires on all cylinders until I throw it in gear, then loses all power and sometimes chokes.—E. A. Solecki, South Chicago, Ill.

The loss of compression may be due to insufficient clearance between the valve and push rod, a bent valve, worn piston rings, or a scored cylinder. In regard to the engine choking up, we would suggest that the strainer screens in the carbureter and gasoline line be cleaned and the carbureter adjusted to the leanest possible mixture consistent with good road performance.

#### Spark Timing on Studebaker

Q.—Show instructions for timing spark on Studebaker six, series 17.—L. J. Charles, Santa Fe, N. M.

To time the spark first turn the engine over until No. 1 cylinder is on its compression stroke and obtain the exact dead center by bringing the mark UP D-C-I on the flywheel. Under the pointer on the top of the flywheel. Turn the flywheel until this mark has traveled  $5\frac{1}{2}$  in. to travel before reaching the pointer. Now advance the spark lever until it is in its extreme position and the engine will be in position for a fully advanced spark in No. 1 cylinder. Then remove the distributor cover and the distributor arm and loosen the nut which holds the cam on the tapered shaft. Remove the cam by prying it off with the small special tool supplied in the tool kit for this purpose. Turn the cam in a counter clockwise direction until it reaches a position such that when all parts are

TO assist readers in obtaining as a unit all information contained in this department on a certain subject in which they may be most interested, such as ignition, carburetion, etc., MOTOR AGE has inaugurated the segregation of inquiries into classes of allied nature. Questions pertaining to cooling will be answered under that head and so on.

#### VALVE TIMING

E. Solman.....Toronto, Can.  
J. S. Badger.....Brisbane, Australia

#### MISCELLANEOUS

Edmund B. Morris.....Albia, Iowa  
Keller Brothers.....Foster, Neb.  
James Brown.....Chicago  
Guy A. Thornsberry.....Island, Ky.  
W. A. Stephenson.....Findlay, Ohio  
James White.....Spokane, Wash.  
E. A. Solecki.....South Chicago, Ill.  
M. Rix.....Oak Park, Ill.  
R. S. Coad.....Charlotte Hill, Md.  
Bacon Garage.....Cando, S. D.  
H. C. Schutte.....Minneapolis, Minn.  
F. C. Calkins.....Pencaca City, Okla.  
Lewis Darling.....Fulton, Mo.  
J. Earl Wyatt.....Salina, Kan.

#### THE ELECTRIC SYSTEM

C. W. Kemper.....Exeter, Mo.  
J. M. Roan.....Edenwold, Tenn.  
Ralph L. York.....North Powder, Ore.  
Keller Brothers.....Foster, Neb.  
Fred Ueismwanger Walla Walla, Wash.  
F. W. Smith.....Brooklyn, Wis.  
A. D. Rittersbacher.....Battlesville, Okla.

#### ENGINES

M. Rix.....Oak Park, Ill.  
R. H. Emery.....Council Bluffs, Iowa  
W. Thornton Mays.....Marshall, Tex.  
Edmund B. Morris.....Albia, Iowa  
E. A. Solecki.....South Chicago, Ill.  
L. J. Charles.....Santa Fe, N. M.  
C. J. Scott.....Winnipeg, Can.

No communication not signed by the writer's name and address will be answered in this department.

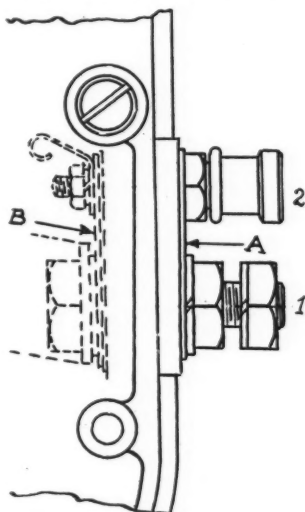


Fig. 11—Diagram for connecting ammeter on Oakland

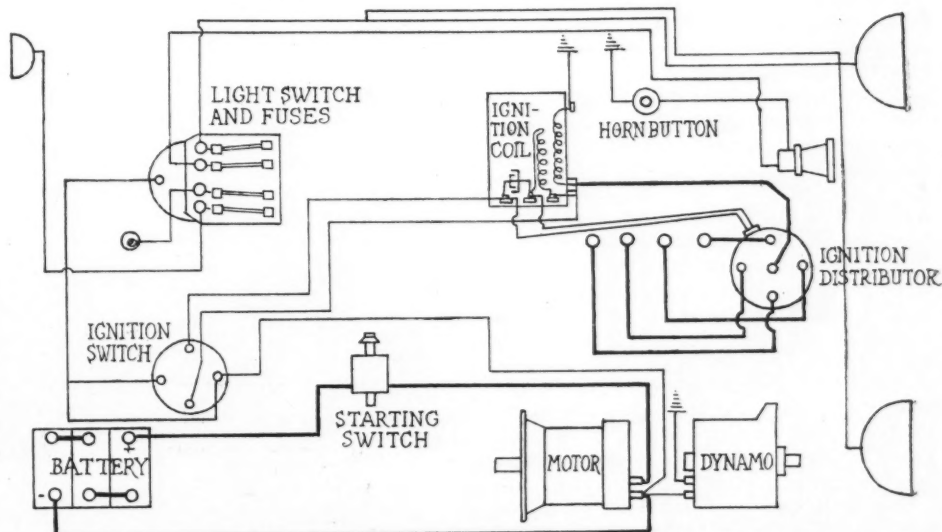


Fig. 12—Wiring diagram of Hupmobile, in which ignition is separate

replaced the edge of the distributing arm will come directly under No. 1 distributor segment. Then continue turning until the breaker points are just in the act of separating. Tighten the lock nut to hold the cam in position and replace the distributor arm and cover.

In testing the accuracy of the adjustment, make sure the electrical connections from the battery to the coil and distributor are complete. Disconnect from the coil the high-tension cable leading to the center terminal of the distributor. Place the point of a wooden-handled screwdriver on the base which supports the coil and have it held so that the metal part of the screwdriver is about  $\frac{1}{8}$  in. from the high-tension terminal of the coil. Fully advance the spark lever on the steering wheel and turn on the ignition switch. Open the pet cocks and turn the engine over slowly by hand until the spark jumps from the coil terminal to the screwdriver. Note how far the upper dead center mark on the flywheel must travel before reaching the pointer. If the distance is the amount specified the adjustment is correct.

## Rebuilding

#### Raceabout Body for Hupmobile

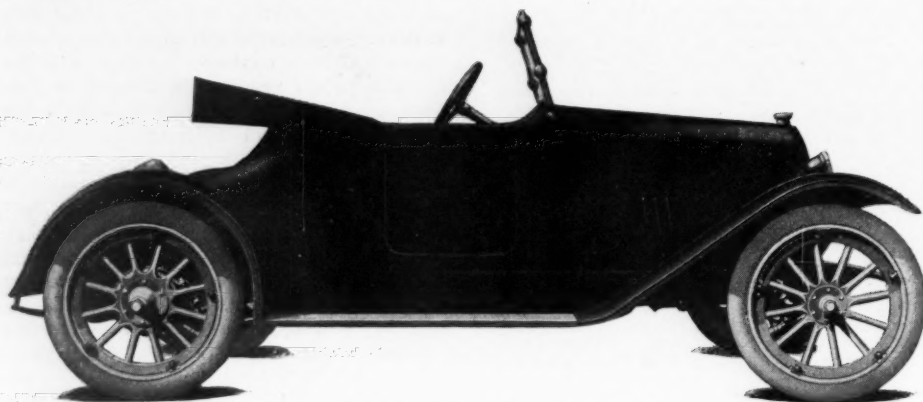
Q.—Publish sketch of how to build a racing or raceabout body on a 1912 Hupmobile 20 roadster.—E. A. Solecki, South Chicago, Ill.

A suggested body design for this car is shown in Fig. 10.

#### Modernizing 1913 Hupp Body

Q.—Give suggestion for converting body of Hupmobile 20 model 1913 without changing the chassis and making a more up-to-date body, with gas tank under cowl, windshield, larger hood and box on rear. Also make the seat wider.—C. J. Scott, Winnipeg, Canada.

In Fig. 10 is shown a suggestion for converting a Hupmobile 20 into a raceabout type, in answer to a query from E. A. Solecki, South Chicago, Ill. While this does not exactly cover the points you mention you may get some ideas from it which will help you to build a more modern looking body. To put a box on the rear you would have to end the body at the seats leaving a part of the rear deck exposed for the tank mountings. To widen the seats it is only necessary to give a greater overhang to the body.



Maibohm sport roadster, a four-cylinder car with a wheelbase of 105 in., which sells at \$795

## Maibohm Adds a Six-Cylinder

Custom Colored Five- and Four-Passenger Touring Cars Offered on 115-in. Wheelbase

THE Maibohm Motors Co., Racine, Wis., has added a six-cylinder car and will offer it in custom-colored five-passenger and four-passenger touring styles at \$975. The car has a wheelbase of 115 in. A Falls engine is used,  $3\frac{1}{8}$  by  $4\frac{1}{4}$ , with overhead valves and a Wyman-Gordon counterbalanced crankshaft. The piston displacement is 195.6 cu. in., while the S. A. E. horsepower rating is 23.44 and it develops 40.6 hp. at 2290 r.p.m.

The valve lift is  $\frac{1}{2}$  in. Lubrication is by cam-operated pump to main bearings and splash to cylinders and front gears. A Stromberg carburetor is fed by a Stewart vacuum system from a 14-gal. tank in the rear. Cooling is by thermo-siphon, with Perflex radiator. Starting and lighting are by Wagner 6-volt, two-unit system and Willard battery. Ignition is Atwater Kent, manual advance, with the distributor on the left rear deck of the crankcase and driven from the camshaft in an independent unit.

### Borg & Beck

A Borg & Beck clutch is used, and the transmission is Mechanics, selective type, three speeds forward and one reverse, in unit with the powerplant. Drive is Hotchkiss through two  $4\frac{1}{2}$  in. universal joints and tubular propeller shaft. Brakes, lined with wire-woven asbestos, act on the rear wheel drums, internally and externally, the drums being 12 in. in diameter and 2 in. wide. Steering gear is Jacox. The rear axle is full floating with Warner differential and Bower roller bearings. Two Bock taper roller bearings are in the third member. The gear ratio in high is 4.5 to 1. A Maxim Silencer muffler is used.

Springs are semi-elliptic; front, 36 by  $1\frac{3}{4}$  in.; rear, underslung, 49 by  $1\frac{3}{4}$ . Wheels are artillery type with Stanweld rims. Wire wheels are supplied at \$100 extra for a set of five. Regular tire equipment is Good-year, 32 by  $3\frac{1}{2}$  in. A Stewart 60-mile speedometer is part of the equipment.

The Maibohm sport roadster, priced at \$795, a four-cylinder with a wheelbase of 105-in., enters its third year without im-

portant chassis change. The body lines have been refined somewhat, and a detachable winter top now is furnished at \$70 extra. A permanent coupe at \$1,095 has been added.

### CENTRALIZE RUBBER IMPORTS

New York, Dec. 15—Hereafter all rubber imported will be consigned to the Rubber Association of America, which is acting as representative of the War Trade Board in this. The purchaser will be advised of the receipt and to obtain the rubber will make declaration on specified forms, of which the principal part is a guarantee neither to export nor to permit export of any rubber or rubber articles without license from the War Trade Board.

This system is to prevent absolutely Germany or any of her allies from obtaining rubber. The United States Government, through the War Trade Board, requested the association to take this action and a committee known as the rubber and kindred products committee has been appointed to handle the matter. Licenses for export of manufactured rubber can be obtained from the War Trade Board. In signing the form which permits the importing the manufacturer binds himself not only not to export but also not to sell to any person in the United States unless satisfied there is no intention on his part to attempt to export or resell for export without license.

To import rubber, scrap rubber or kindred products the American manufacturer or importer instructs the foreign supplier to ship to the Rubber Association of America, marking the consignment so that the association may notify the purchaser of its receipt.

The association will have representatives at New York and San Francisco and the importers will have to send to them the bills of lading, etc., together with his guarantee made out on a form obtainable from the War Trade Board. When these regulations are complied with the association will release the consignment and it will go forward to the importer.

There are four classes of importers: First, a manufacturer who imports direct; second, an importer working in conjunction with a manufacturer; third, an importer of scrap or reclaimed rubber; and fourth, an importer alone. For each of these there is a different guarantee form, but the provisions are in the main the same and have the one object of preventing unlicensed exportation.

In the case of the association's representatives being dissatisfied with the evidence placed before them by the importer and so refusing to release a consignment, it is stipulated that the dispute be referred to the War Trade Board for whom and under whose instructions the association is acting.

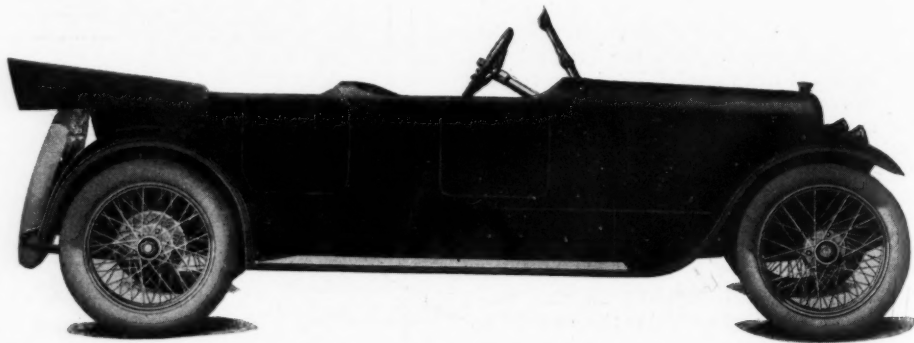
To prevent undue delay in delivery of consignments to manufacturers or others there is a provision whereby release may be given before the receipt of bills of lading which are frequently received after the shipment.

### PENNSYLVANIA ADDS CAR

Pittsburgh, Pa., Dec. 17—The Pennsylvania Motor Car Co. is manufacturing a new six-cylinder model, styled the Pennsy six. This car sells for \$1,435, in the five-passenger model. It has 119 in. wheelbase, Continental engine, Schebler carburetor, Atwater Kent ignition, Detroit gearbox, Westinghouse starting and lighting system and full floating Columbia rear axles. In addition a special four roadster or touring model for \$1,065 is manufactured.

### BAY STATE BUSINESS GOOD

Boston, Mass., Dec. 14—The Massachusetts Highway Commission had registered 174,274 motor vehicles up to Dec. 1 of this year. That is 37,465 more machines than were registered for the entire year of 1916. Of the total 26,008 were commercial vehicles. Last year 18,194 trucks were registered, so the gain for this year is 7,814. Deducting that number from the total it leaves 29,651 passenger cars registered this year.



Maibohm six-cylinder to be offered as four- and five-passenger



The greatest gains were made in the last few months for passenger cars, for until July 1 only 2,262 more machines were listed than for all 1916. In the next two months 15,451 cars were listed and very nearly as many during the last three months. Of the cars added to the list over last year's figures 27,389 were registered in the last five months.

This is pretty good evidence that there is some prosperity in Massachusetts as far as the motor trade is concerned. Also that men are willing to put money into the business is shown by the fact that 402 more dealers have been added to the list this year so that now 2379 firms are handling motor vehicles while in 1916 there were 1977.

There are more than 30,000 additional operator and chauffeur renewals this year than last, and nearly 13,000 more additional operators listed, while there are now about 211,000 people in Massachusetts who have the privilege by law of driving motor cars.

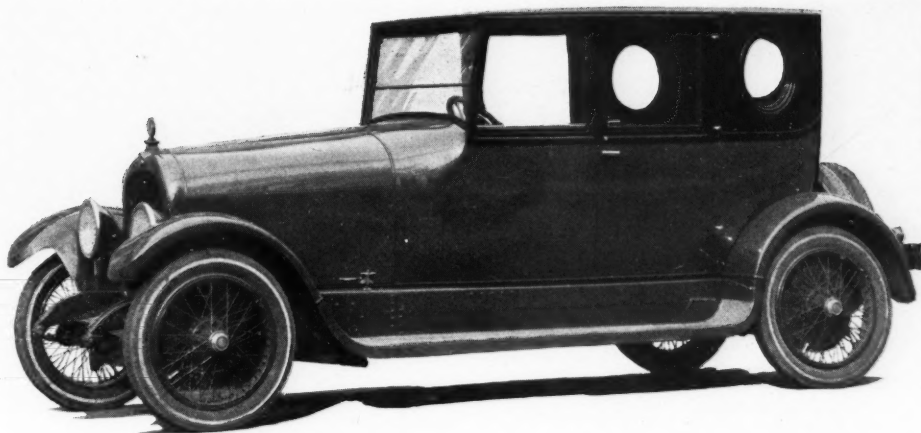
The financial returns to the state have been very good, too, for when the fines have been turned over to the commission the total for fees, fines, etc., will run above \$2,000,000, or pretty nearly \$500,000 more than for 1916.

#### UNITED TRUCK OUT SOON

Chicago, Dec. 17—The United Four Wheel Drive Truck Corp., manufacturer of the United Four Wheel Drive truck, shortly will be in production. A thirty-day test has been completed very successfully, the truck covering a total of 1000 miles. The Government now is making a test of this truck at the Rock Island arsenal. The latest reports were that the truck is meeting with the Government's expectation. The truck will be manufactured in quantities in Chicago for commercial purposes.



Interior of custom-built Rubay body on Marmon chassis



Special Rubay body on Marmon chassis such as will be supplied, in limited numbers, with optional finish

## Special Rubay Body on Marmon Chassis

Custom-Built Limousines and Town Cars to Be Finished and Trimmed at Buyer's Option

A SPECIAL four-passenger custom-built sedan on a Marmon 34 chassis is illustrated on these pages. The body is by Rubay Co. of Cleveland, Ohio, and was made specially for F. E. Moskovics, vice-president of Nordyke & Marmon. A limited number of Rubay limousines and town cars are to be built by the Rubay Co. on Marmon 34 chassis. They will be finished and trimmed to suit the buyer; in short, they will be custom built throughout.

#### FREIGHT CARS LIKE MOTOR CARS

Washington, Dec. 15—Freight cars are being produced now in quantities approaching the output of the motor car industry.

One freight car manufacturer in California is turning out a freight car every working hour, and other manufacturers throughout the country are closely following this record, forecasting a huge freight car supply both for the allies and the American Railroad of France and our national railroad systems.

#### SHALER ADDS ROADLIGHTER

Waupun, Wis., Dec. 14—The C. A. Shaler Co., long known in the vulcanized field, has entered a new and entirely different field. It has obtained the sole selling rights for a new type of headlamp lens which is to be marketed under the style Shaler Roadlighter. The lense is made of molded optical glass, smooth on the front and having a series of prisms on the back, which deflect all projected light so that it does not rise higher than 42 in. above the road and also illuminates at the sides as required by the lighting laws in various states. Various sizes will be made, those for Ford selling at \$2.75 and for all other cars at \$3.50. The addition of the Roadlighter does not mean that the vulcanizer business will be curtailed; on the contrary, it will be practically doubled in 1918.

#### TESTS BLUE SKY LAW

Phoenix, Ariz., Dec. 14—Steps to test Arizona's blue sky law as applying to unincorporated associations of individuals has been begun in the U. S. District Court here by the Arizona Motor & Truck Association. The association filed with the corporation commission and applied for permission to sell memberships at \$100 each. It was proposed to erect a factory at Phoenix and to build cars and trucks, the parts for which would be purchased in the East. The corporation commission refused to issue a permit to sell memberships on the ground that present conditions at factories in the East made it practically certain the proposed plant would not be able to obtain parts needed to build cars.



## New Kerosene Steel Mule in Spring

A NEW kerosene creeper tractor, the model D Bates Steel Mule, is to be marketed next spring by the Joliet Oil Tractor Co., Joliet, Ill. This tractor weighs about 3750 lbs., has a drawbar pull of approximately 3600 lb. and is adapted to hauling three bottoms.

The engine is a four-cylinder valve-in-head type with a bore of 4 in. and a stroke of 6 in. The powerplant, including the two-speed gearset, is a unit which forms the main frame of the tractor, being mounted on a pivot on the front axle midway between the front wheels. The steering construction is similar to that used in motor car construction and in connection with the individual brakes on the driving crawlers permits of a turning radius of slightly less than 9 ft.

The driving mechanism consists of two crawlers independent of each other and capable of vertical movement which adds



Two photographs of model D Bates Steel Mule in operation, which demonstrate flexibility and performance of the two crawlers independent of each other

greatly to the flexibility of the machine. These crawlers are set inside of the front wheels, which while plowing run in the furrow, and the crawlers travel on the solid unplowed ground. Each crawler is equipped with an individual brake which can be used to stop one crawler and greatly facilitates turning.

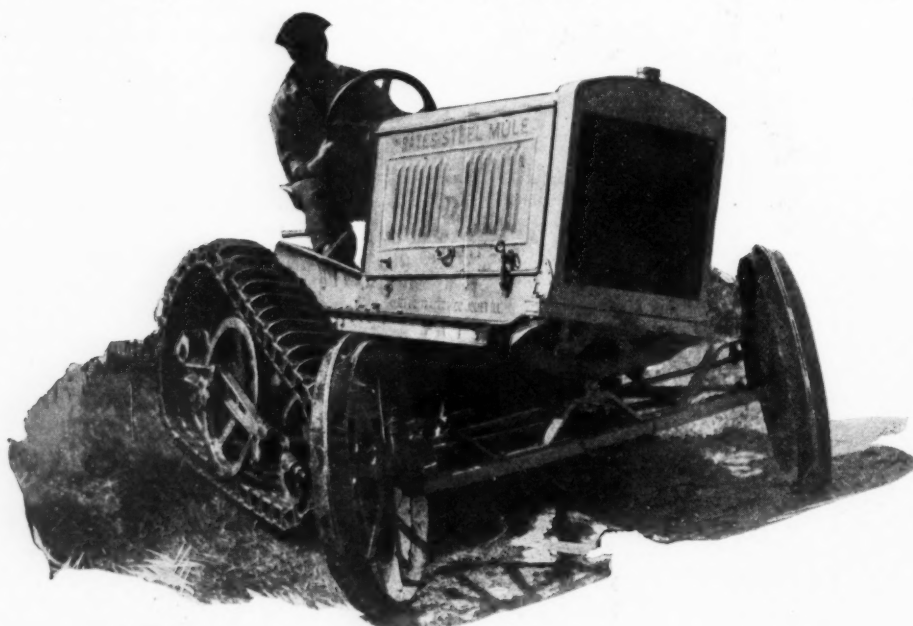
The crawlers are of such size that the ground pressure is a little over 3 lb. per

square inch, which makes it rather easy for the tractor to handle itself in soft ground. The tractor is practically self-guiding when plowing and on account of its low center of gravity is well adapted for work in hilly country.

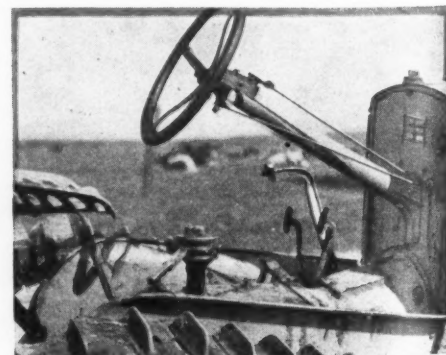
The tractor has two working speeds, one 2½ m.p.h. and the other 3½ m.p.h., either of which can be used for plowing, disking, etc., depending upon the condition of the ground.

### CORRECTION

The top built by the Detroit Weather-proof Body Co., Pontiac, Mich., for a Chalmers car, touring model, sells at \$97.50 and not at \$185, as was erroneously stated in the issue of Nov. 15. The touring top for the Chandler car sells at \$185, but the Chalmers top sells at \$97.50.



Demonstration of extreme flexibility in the kerosene creeper made by the Joliet Oil Tractor Co. and called the Bates Steel Mule.



Motor car type of steering construction on Bates Steel Mule



# Mak-a-Tractor Brings Out Any-Auto

A UNIVERSAL motor car tractor attachment, known as the Any-Auto tractor is announced by the Make-A-Tractor Corp. of America, Chicago, which is adaptable to any make of motor car. It is claimed by the manufacturer that this device can be attached in from 15 to 20 min. ready for work in the field. The various features include an auxiliary cooling system, consisting of a centrifugal pump and a specially designed fan to aid in keeping the power unit cool when working under severe conditions. A device for attachment to the carburetor to prevent dust from entering the engine also is supplied.

In mounting the attachment the rear wheels of the motor car are removed and the two driving pinions which mesh with the bull gear on the tractor wheels are attached. All implements are pulled by the attachment itself, thus relieving the chassis of the motor car as much as possible from the strain of the work. The gear reduction is 11 to 1. Traction is secured by the semi-concave creepers shown in the illustration. For sandy soil special 10-in. angle creepers are supplied.

The two side channels are attached to the chassis by side clamps, and slots are cut in the forward end of the channels, which allow for the spring action of the car. An attachment also is provided by which belt power can be had for various kinds of farm work. Special pinions also are provided for road work which give a speed of about 6 m.p.h. The maker states that this attachment will do the work of four to eight horses and will plow about  $\frac{1}{4}$  more acreage than horses.

The attachment lists for \$225.

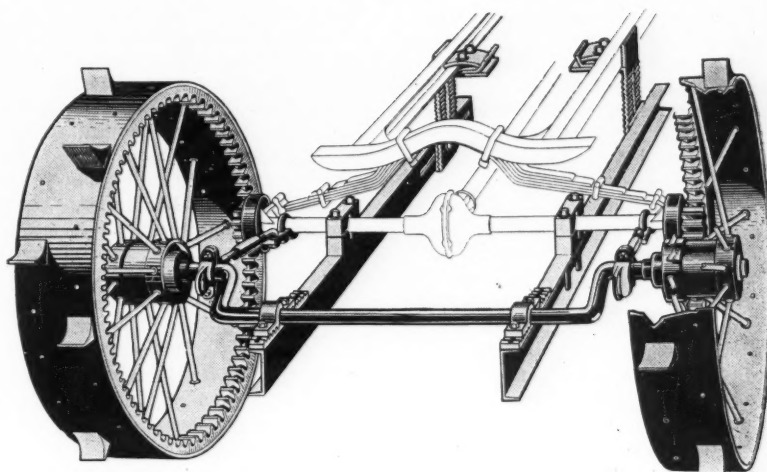
## TRAFFIC SUBWAY PLANNED

New York, Dec. 17—A tunnel for motor truck traffic will be built under the Hudson river from Manhattan to New Jersey, if the plan outlined to New York and New Jersey officials by Gen. George W. Goethals is accepted. General Goethals is in favor of constructing a tube of sufficient height to accommodate trucks immediately, with a roadway above for motor cars. It is his idea that motor vehicles can operate under the river without endangering the public health by the gases which their exhausts give off, and he denies the suggestion that the tunnel would not be practical because carbon monoxide would be present in dangerous quantities. The operation of motor vehicles through the tunnels under the Thames river without disastrous results is cited by General Goethals, who favors a single tunnel large enough to provide for slow trucking below and faster cars above.

Tentative plans were made by a former



Any-Auto tractor attachment at work in the field



Any-Auto attachment, showing construction of wheels and creepers

commission before General Goethals took charge but were for different types of construction. After careful investigation, General Goethals rejected the proposed trench method as unsuited to the nature of the river bottom. It is estimated the work would take three years and cost \$12,000,000.

## FISHER BODY SURPLUS \$993,561

Detroit, Dec. 15—The Fisher Body Corp. for the quarter ending Oct. 31 shows a surplus of \$993,561. This is a gain of \$246,211 over the surplus of the preceding quarter. Allowing for dividends on the \$5,000,000 outstanding preferred stock, the available balance for the \$200,000 shares of common stock is \$4.53 a share. This is an increase of \$1.24 a share for the preceding quarter.

## OVERLAND CHANGES SALES PLAN

Toledo, Ohio, Dec. 15—Willys-Overland, Inc., has developed a new sales department organization to bring the factory into closer touch with the dealer organization. Under the new system the country is divided into seven divisions, each of which is under the direct supervision of a resident division manager who has full power to act for the company. Two new executives have been brought into the organization for this plan, J. I. Handley, manager of the east central division, formerly of

the Mutual Motors Co., of Jackson, and A. C. Barber, manager of the west central division, formerly with the Moline Plow Co. The other managers are: William L. Colt, eastern; George H. Cox, midwestern; F. C. Riggs, western; E. N. Culver, southern; and C. M. Leroux, northwestern district.

George M. Berry, formerly director of branches, and K. R. Jacoby, formerly assistant manager, will be associated with Vice-President Edwin B. Jackson as assistant commercial managers.

## COOLING PATENT UPHELD

Chicago, Dec. 14—The exhaust-operated circulating system patent of the Motor Cooling Systems Co., Baltimore, Md., has been declared valid and infringed in an action brought by the company against the Smith Form-A-Tractor Co. The patent is No. 1,138,962. The case was heard by Judge George A. Carpenter in the United States District Court.

## SAXON MAKES DELIVERY CAR

Detroit, Dec. 15—The Saxon Motor Car Corp. is delivering to dealers a 500-lb. light delivery car built on its six-cylinder chassis. Either panel body or open body with curtains is supplied. The chassis has been made slightly heavier and strengthened where necessary for the additional load. The price is \$850.

# The Motor Car Repair Shop

## Care and Retiming of the Magneto

**A** MAGNETO in order to be properly cleaned should be removed from its mounting on the engine. To remove the magneto disconnect the universal joint and remove the four cap screws holding it to its base. After removing the magneto from its mountings, take off the distributor board and examine its surface. If it is of the wipe-contact type then the board either must be cleaned or, if the surface is rough and worn, it would be well to have a very light cut taken from same in a lathe, in order to true up its face and to prevent the possibility of the rough surfaces wearing the carbon brushes, which will deposit on the face of the board and cause a short-circuit. If the contact surface of the board is coated with the carbon from the brushes this is sometimes responsible for backfiring and kicking of an engine when starting it.

### Metal Deposits

The direction of primary current flow through the breaker points is always in the same direction; hence, the metal of the breaker points will be deposited on one of the points and removed from the other. This makes it necessary to line up the breaker points and adjust the amount which the points separate. It is best to remove the points, provided they are pitted and square up their contact surfaces. To avoid wasting the point metal it is best to shape these roughly with a light weight hammer before filing them to a true surface. Replace the points in the breaker mechanism and see that they line up with each other perfectly. If they do not appear to be exactly true, then with a fine Swiss file bring them to a true surface. The clearance between the points should be about 0.010 in.

The high-tension collector ring usually is located at the driven end of the magneto. This consists of a brush which makes contact with the collector ring on the armature. All that is necessary is to clean the ring and cut the glazed surface from the end of the brush with 00 sandpaper.

If when turned over on the bench the magneto throws a weak spark, this is probably due to weak magnets. The lifting power of the average-sized magnet is about 15 lb. and is suitable for service if it can sustain this weight. The smaller magnets usually are capable of lifting about 10 lb. Provided the magnets fail to meet these requirements it then will be necessary to have them recharged.

The chief difference between the high- and low-tension magneto is that the high-tension has the secondary coil incorporated in the armature and generates high-tension current direct. The low-tension generates primary current and has a high-tension coil located independent from the magneto. The latter system, of course, has considerable more wiring than the high-tension, which

requires attention to keep the terminals tight.

The four-cylinder magneto runs at engine speed and the six-cylinder at one and a half times engine speed. To replace the magneto on its base and have it in proper relation to the engine proceed as follows: Turn the engine over until No. 1 cylinder is on upper center of its power stroke. The upper dead center can be located by means of the center mark on the flywheel, or by observing the time when the inlet valve closes and then by means of a wire through the spark plug or the priming cup aperture turn engine over until the piston has reached the upper position of its stroke. The distributor arm in the magneto then should be set so that it is in contact with the segment on the distributor board corresponding to No. 1 cylinder. The magneto now can be attached, as it is in correct relation to the position of the engine crankshaft.

Some types of magneto installations have clutch couplings by which it is possible to change the time of the breaker points opening with reference to the position of the piston without making it necessary to change the relation of the magneto driving gear with reference to the cam and crankshaft gears. The correct timing for a magneto is usually to have the breaker points begin to open when the piston has reached the upper dead center on its power stroke when the magneto breaker mechanism is in its fully retarded position.

A common source of trouble in the wiring to spark plugs is conducting the wires through metal tubes, which after a year or so of service develop short-circuits due to becoming oil soaked or to being chafed by the conduit. The missing of one cylinder frequently can be traced to difficulty of this nature.

### Detecting Valve Leaks

In the majority of cases the gradual deflation of a tire can be traced to a leaky valve. It is quite easy to find such a leak and the only apparatus required is a common glass tumbler or tin can. Revolve the wheel so the valve is on top pointing downward, of course. Place the glass of water under it; if small bubbles rise to the surface it means that the valve is not screwed down tight enough, or is leaky. In this case the core or inner parts should be removed with the valve cap and attended to. There is a little conical-shaped rubber washer on the valve plunger, and if this is worn or mutilated the valve will not be tight. A new plunger or core is required in this case. Sometimes a drop of oil in the valve will remedy a leak caused by the parts sticking slightly, but this should be done only when no new cores are at hand. Also the air must be let out of the tire, otherwise the pressure will simply blow the

oil out before it has a chance to reach the inner parts.

Every motorist should make it a rule to carry several extra valve parts in his kit, as much of the trouble that is sometimes laid to a porous tube or puncture is in reality caused by a leaky valve, which can be remedied in a few minutes with no effort save pumping the tire. Even here modern engine-driven tire pumps relieve the owner of physical effort. A leaky tire valve is also a source of insufficient tire life, because it means that it will be run in most cases under insufficient pressure. The slow deflation also causes much inconvenience by the frequent necessity of inflation which is a nuisance at best.

### Care of Car Finish

The finish of a motor car easily can be ruined in cold weather unless proper care is taken of it. The car should be kept in a garage which is neither hot nor cold, but the temperature should be as nearly constant as is possible on account of great changes in the temperature range that affects the paint.

A car should never be washed out in the cold but in a warm garage and then with clean cool water. Do not use any more soap than is absolutely necessary, as the acid and alkali in it tends to soften the varnish coat. If a car is covered with mud it should be soaked off with water and not rubbed off, as this latter process will scratch and break the finish coat, subjecting the color coat to the effects of the weather.

Checking of the paint on a car is due to removing it from a hot garage in the winter time to the colder outdoors, which causes the paint to contract and check. Thus it is advisable to keep the garage at a moderate temperature to avoid this difficulty.

A little care in this respect will preserve the finish of a motor car to a most remarkable degree.

### WIRING DIAGRAMS IN SUIT

Chicago, Dec. 14—The American Bureau of Engineering, maker of the Ambu electric trouble finder, has won a copyright infringement suit against the International Motor Institute, Chicago. Judge Carpenter in the United States Circuit Court within the last week issued a restraining order prohibiting the sale of the book of wiring diagrams called the Official Wiring Guide, published by the International Motor Institute. It was held that these were infringements of the 400 copyrighted wiring diagrams published by the American Bureau of Engineering as a part of its service. Temporary injunction was issued Oct. 26 and was made permanent Dec. 4. The question of damages is now in the hands of the Master of Chancery.





# The Accessory Corner

## H-B Battery Charger

THE H-B battery charger consists of full 500-watt equipment which is a universal voltage machine, recharging any motor car storage battery. The device automatically takes care of 6-, 12- or 24-volt batteries at the same time. It is said to be practically trouble- and wear-proof. To use, connect to the lines already in the garage, or belt-driven equipment for both charging and lighting can be supplied. The instrument recharges from one to seven batteries at a time. Price, \$175.—Hobart Brothers Co., Troy, Ohio.

## Kant-Leak Gasoline Shut-Off Cocks

The features of these shut-off cocks, which are made in all the various sizes and styles common to motor car practice, are the key and stem construction. The key is ground to a perfect heat and held there by a spring, this spring pressing upward and against packing that is placed around the valve stem. Thus at all times both key and packing are under compression that tends to prevent leakage. In addition the taper plug is turned to a glass finish. The list price of Model 170 C. 1,  $\frac{1}{8}$  in., is \$2.30.—Michigan Lubricator Co., Detroit.

## Improved Swivel Joint

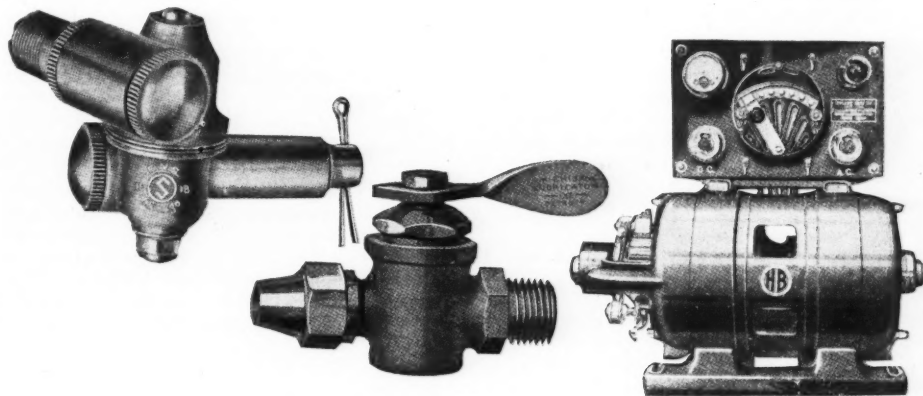
The improved swivel joint put out by F. W. Stewart is one of the products which makes the concern able to advertise all speedometer parts except heads and has interchangeability of parts, permitting easy and inexpensive replacement and quick disassembling and reassembling for cleaning. Worm drive is used throughout, each gear and shafting is cut from one piece and each gear has a projection on the end which fits into a bearing in the grease cup, which insures keeping the gears in alignment regardless of wear. An unusually large bearing surface in the center of the housing with heavy steel washers has eliminated one of the weak points of swivel joints, it is claimed. The ability to change the swivel joint from a right-hand drive to a left-hand drive merely by reversing the shaft connection and the grease cup connection, end for end, is another advantage. Models are, for right hand,  $2\frac{1}{2}$  to 1 for Stewart speedometers; left hand,  $2\frac{1}{2}$  to 1 for Stewart speedometers; right hand, 1 to 1 for Johns-Manville standard and Sears-Cross speedometers right-hand drive—Ford equipment only. Price, \$2.50.—F. W. Stewart, 1402-1406 Michigan avenue, Chicago.

## Two Weaver Products

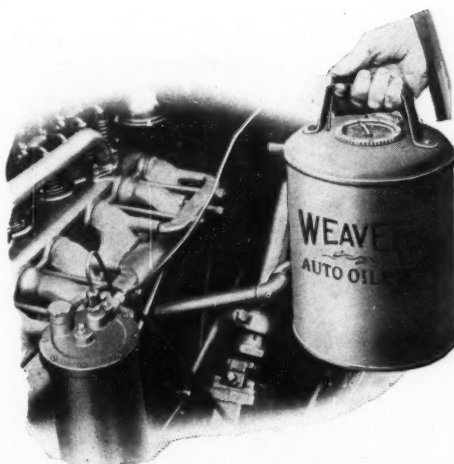
The Weaver tire spreader is for the garage, to make quick and convenient inspection of tire casings. A nest of rollers, designed to protrude through the buffing plate, carries the weight of the tire when it is being revolved on the device for inspection. The rollers are suspended on spring tension which allows them to be



Weaver spreader, showing casing with plate applied off the stand



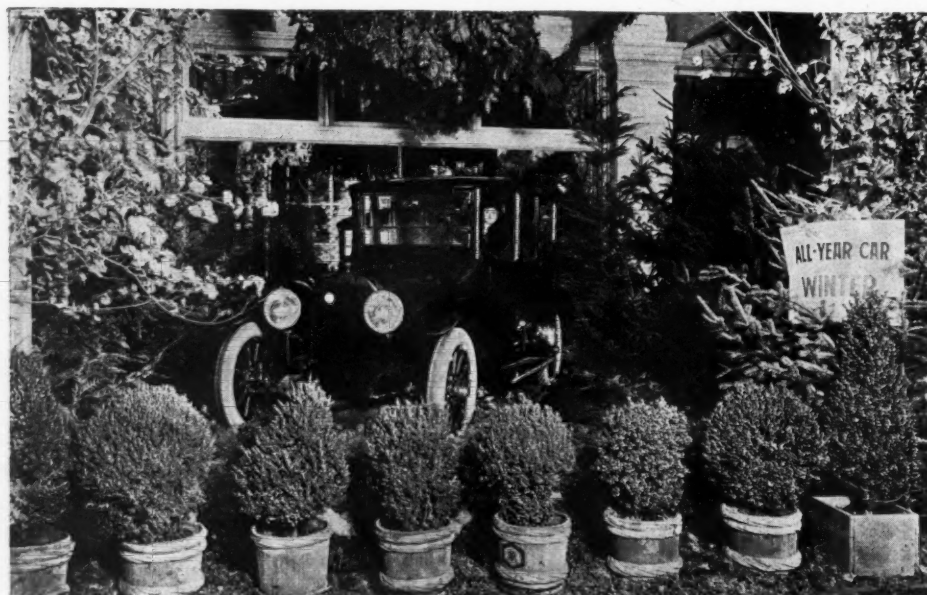
Stewart speedometer swivel, left; Kant-Leak cock, center, and H-B battery charger



Weaver self-measuring oiler

pressed down flush with the face of the spreader plate as the force of the jaws is applied to the beads of the casing for spreading. The convex plate which forms the table of the spreader is equipped with hooks which, after the casing is spread by the jaws, can be applied to the bead at each corner of the plate, holding the tire permanently spread. The casing with the plate thus applied can be lifted off and carried to the buffing wheel and the break in the casing buffed to the best possible advantage. The Weaver oiler is self-measuring, with a spout which can be turned downward into any position to enable it to be inserted into the oil opening of the engine. The oil is released by a thumb button on the grip. A dial gage on top indicates the number of quarts in the oiler and also the number being discharged. It is of heavy galvanized iron with a capacity of 2 gal. Prices, spreader, \$20; oiler, \$7.—Weaver Mfg. Co., Springfield, Illinois.

# Among the Makers and Dealers



**HOW KISSELKAR DEALERS TEST CARS**—Winter scene in which the evergreens over the car conceal a battery of sprinklers. All day long rain fell on the car, which was jacked up and with wheels revolved by a motor attachment. The test was put on by dealers all over the country and was to show the waterproof qualities of the car

**KREUDER to Manager Gryphon**—W. J. Kreuder has been elected vice-president and general manager of the Gryphon Rubber & Tire Corp., New York.

**Mendel Now With Champion**—E. Harvey Mendel, formerly sales manager of the Rex Ignition Co., New York, has joined the sales forces of the Champion Ignition Co., Flint, Mich.

**Republic Truck Gives 113 Men**—The service flag of the Republic Motor Truck Co., Alma, Mich., bears seventy-three stars and over forty stars are yet to be added, as that number have joined the colors since the flag was ordered.

**Four-Drive Tractor Elects**—Jotham Allen has been elected president of the Four-Drive Tractor Co., Grand Rapids, Mich.; J. C. Jenkins, vice-president and sales manager; Albin Johnson, secretary-treasurer, and H. E. Frederick, director, succeeding E. J. Jenkins.

**Boone Tire Establishes New Branch**—The Boone Tire & Rubber Co., Chippewa Falls, Wis., is establishing a southwestern factory branch at Fort Worth, Tex., to be opened Jan. 1. The company maintains a plant in Sycamore, Ill., and is completing its main works at Chippewa Falls, which will be ready at the end of the year.

**Jobbers Get Winter Sticker**—Stickers for promoting the winter business idea are to be furnished to members by the National Association of Automobile Accessory Jobbers. The committee on assisting the trade plans to distribute thousands of these among members. The committee already is running constructive advertising in trade papers.

**Champion Plug Salesmen Meet**—Members of the sales force of the Champion Spark Plug Co. are at Toledo, Ohio, for the annual sales convention as guests of the company this week. Business sessions include trips through the company's Toledo and Detroit factories, talks by prominent men, round-table discussions, moving pictures and demonstrations of salesmanship, while one of the

features of entertainment is an indoor athletic meet in which members of the sales staff took part.

**Thomas Leaves Hercules Motor**—Urving G. Thomas, production and efficiency engineer of the Hercules Motor Mfg. Co., Canton, Ohio, has resigned.

**Reinhard to Distribute Gray & Davis**—The Reinhard Bros. Co., Minneapolis, Minn., has been appointed sole distributor of Gray & Davis starting and lighting systems for Ford cars in the territory of northern Wisconsin and North and South Dakota.

**Federal Truck to Expand**—The Federal Motor Truck Co. has let the contract for an addition to its plant which will greatly increase the present floor space. With the completion of this addition Federal facilities will have increased about 100 per cent during the last year.

**Minton Joins Carlisle Company**—Charles H. Minton has been appointed western district manager of the Carlisle Cord Tire Co., with headquarters in San Francisco, Cal. Several years ago Mr. Minton was assistant to G. A. Gilbert, sales manager of the Carlisle company, when Mr. Gilbert managed the United States Tire interests on the Pacific coast.

**Standard Tire to Expand**—The Standard Four Tire Co., Keokuk, Iowa, has plans well under way for the increasing of its capital stock to \$3,500,000. A portion of the new issue of stock will be used in erecting a new building with a capacity of 2500 tires a day. During the last fifteen months the company has increased its employees from forty to 140.

**Atwood Takes Over Boyd**—The Atwood Co., Cleveland, Ohio, has taken over the business of the Boyd Tire & Rubber Co. at Cleveland and will handle the wholesale and retail supply business of that company. Charles G. Atwood, formerly president and sales manager of the Atwood Automobile Co., is the head of the new Atwood company, which will also manufacture the Atwood gearshift lock

and the Miller tire lock. It also controls the distribution of the Cleveland tractor in northwestern Ohio.

**Mesenbrink Buys New Interest**—W. H. Mesenbrink, for five years manager of the Des Moines branch of the United States Rubber Co., has bought an interest in the United Tire Sales Co., Dubuque, Iowa.

**Young Manages Cleveland Branch**—H. B. Young has become manager of the Cleveland branch of the Chicago Pneumatic Tool Co., manufacturer of the Little Giant truck. The territory extends from northern Michigan to New Orleans, La.

**New Building for Chicago Branch**—The United Motors Service Co., Chicago branch of the Delco, Klaxon and Remy companies, will have a new building by March of next year. Complete stocks will be carried in addition to giving service to all cars equipped with Delco, Remy and Klaxon units.

**Masterbuilt Truck Company Formed**—The Masterbuilt Truck & Tractor Co., Decatur, Ill., has been incorporated with a capital stock of \$100,000 to manufacture farm tractors, ambulances, hearses and motor cars. Frank L. Suffern is president; H. L. Suffern, vice-president, and L. E. Davis, secretary-treasurer. One of the products will be a 25-hp. farm tractor, which will have a four-wheel drive instead of two.

**Lost Chassis Never Phased Them**—The ten St. Louis Ford dealers planned to show only delivery cars in their salesrooms one week and call it Delivery Car Week, but the fifty chassis shipped from the factory got lost and the delivery week awaits the locating of the shipment. Each dealer showed a truck chassis plain and with body and a touring car chassis plain and mounted. Five body builders participated.

**U. S. Truck Increases Production**—The United States Motor Truck Co. is increasing its production rapidly and at present is carrying production on 150 trucks at all times. These trucks range from 2½-ton to the 5-ton capacity. Sufficient material is on hand to permit this expansion and the second floor of the assembly building now being used for storage can be devoted to assembling. The distributing force is being increased to care for the increasing production.

**Beck and Hawkeye Consolidate**—The Beck Motor Truck Works and the Hawkeye Carriage & Auto Co., Cedar Rapids, Iowa, have merged as the Beck-Hawkeye Auto Truck Works, with a capital of \$150,000. Additions will be built and the two plants will be combined in the manufacture of trucks. A capacity of 2500 will be available. There will be three models, 1, 1½ and 2-ton, of the internal gear type.

**Congressman-Dealer's War Doings**—Congressman Alvan T. Fuller, who has the agency for Packard cars and trucks at Boston, Portland, Providence and other New England cities, has started out aggressively to help in the war work by releasing some of his best men for Government work and assisting his remaining employees to take care of those in the service. A dance of the Fuller employees at the Packard salesrooms this week netted \$800 for the soldiers. In addition to this Mr. Fuller subscribed for \$1,000,000 worth of Liberty bonds. Then he sent a check of \$1,000 to the Y. M. C. A. war fund and another for \$1,000 to the Knights of Columbus war fund. Following up this work he went to Washington and put in a bill to have taxed the salaries of all the members of the House.



and the Senate, saying that as they had put burdens on the people who elected them, they should share in it themselves.

**Moore Mfg. Co. Reorganizes**—The C. W. Moore Mfg. Co., Detroit, has changed its name to the Princess Mfg. Co. and increased its capitalization from \$2,000 to \$200,000.

**Twenty-four Cars Burn**—Twenty-four motor cars burned in a fire which destroyed the garage of J. Fred Melton at Grand Junction, Iowa, causing damage estimated at \$25,000.

**Cole Manages Fisk Branch**—W. B. Cole, San Francisco, Cal., has been appointed manager of the Seattle branch of the Fisk Rubber Co., to replace W. E. Bayless, who has resigned.

**Johnson with Hyatt Roller**—A. R. Johnson has been appointed assistant advertising manager for the Hyatt Roller Bearing Co. Mr. Johnson was formerly assistant advertising manager of Cadillac.

**Carrell Joins Erd Motor**—William A. Carrell, formerly superintendent of the motor plant of the International Harvester Co. at its Milwaukee works, is now engineer and works manager of the Erd Motor Co., Saginaw, Mich.

**Mahaffey With Oakland Branch**—A. G. Mahaffey has been appointed assistant branch manager at Cleveland, Ohio, for the Oakland Motor Car Co. He was formerly sales manager of the Gray Tractor Co., Minneapolis, Minn.

**Willis-Overland Declares Dividend**—Directors of the Willis-Overland Co. have declared a quarterly dividend of \$1.75 per share on all outstanding preferred stock, payable Jan. 1, to preferred stockholders of record at the close of business Dec. 20.

**Republic Truck Considers Coast Plant**—The Republic Motor Truck Co., Alma, Mich., is reported to be considering the erection of an assembling plant in San Francisco. It recently paid \$125,000 for property in Los Angeles for a similar purpose.

**Burd Ring Changes Policy**—The Burd H. Compression Ring Co., Rockford, Ill., has changed the entire selling policy and for the first time will extend its effort to the wholesale trade. Usual co-operation with the dealer will be maintained, however.

**Joseph Joins The Colors**—H. Belden Joseph, assistant advertising manager of the Kelly-Springfield Tire Co., New York, has resigned to join the colors and hopes to be back on the job here after having helped to place the Stars and Stripes over Unter den Linden, he writes MOTOR AGE.

**Hayes Truck Wheel at Capacity**—The Hayes Motor Truck Wheel Co. has enough business on its books to keep it busy for six months and for the last year has been operating overtime. In the last ten months 37,006 sets of truck wheels have been produced, and about 250 men and twenty women are employed. A new bending department is now in course of construction.

**Oldsmobile Dealers Drive Overland**—Fifty Oldsmobile dealers of Wisconsin made a trip to Lansing, Mich., Dec. 5 under the auspices of the Frint Motor Car Co., Milwaukee, Olds distributor in Wisconsin, which recently entertained the dealers at a sales convention in Milwaukee. Forty-five of the dealers purchased cars to be driven to Wisconsin points, the entire party returning in this manner.

**Lakey Foundry Completing Building**—The new building of the Lakey Foundry & Machine Co., Muskegon, Mich., is practically completed and will be in operation about Jan. 1. The main building is 200 by 300 ft., which, with a small power house, will cost about \$200,000. Government contracts through the Continental Motors Corp. have been obtained and it is expected that the company will spe-

## Coming Motor Events

### MEETINGS

- Jan. 7-8—New York, National Automobile Dealers' Association, board of directors and eastern vice-presidents' meeting.  
Jan. 10—New York, S. A. E., Automotive dinner at Hotel Biltmore.  
Jan. 11-16—New York, National Association of Automobile Accessory Jobbers, convention.  
Feb. 1—Chicago, S. A. E., winter meeting.  
Feb. 1—Chicago, S. A. E., War dinner at Hotel Morrison.

### SHOWS

- Jan. 5-12—New York.  
Jan. 9-27—Cleveland, Ohio.  
Jan. 11-18—Washington, D. C.  
Jan. 11-19—Providence, R. I.  
Jan. 14-19—Rochester, N. Y.  
Jan. 16-22—Milwaukee, Wis.  
Jan. 19-26—Montreal, Canada.  
Jan. 19-26—Detroit.  
Jan. 19-27—Cleveland, Ohio.  
Jan. 21-26—Scranton, Pa.  
Jan. 21-26—York, Pa.  
Jan. 21-26—Portland, Ore.  
Jan. 21-28—Wilmington, Del.  
Jan. 22-25—Oklahoma City, Okla.  
Jan. 22-26—Baltimore, Md.  
Jan. 26-29—Quincy, Ill.  
Jan. 26-Feb. 2—Chicago.  
Jan. 26-Feb. 2—Harrisburg, Pa.  
Feb. 2-9—Minneapolis, Minn.  
Feb. 5-9—Binghamton, N. Y.  
Feb. 9-16—Kansas City, Mo.  
Feb. 11-16—Kansas City, Mo.  
Feb. 11-16—St. Louis, Mo.  
Feb. 11-17—Toledo, Ohio.  
Feb. 18-23—Syracuse, N. Y.  
Feb. 18-23—Grand Rapids, Mich.  
Feb. 18-23—Springfield, Ohio.  
Feb. 18-23—Des Moines, Iowa.  
Feb. 18-25—Pittsfield, Mass.  
Feb. 18-27—South Bethlehem, Pa.  
Feb. 22-March 2—Salt Lake City, Utah.  
Feb. 26-March 3—Omaha, Neb.  
March 2-9—Boston, Mass.  
March 6-9—Clinton, Iowa.  
March 6-9—Sioux Falls, S. D.  
March 16-20—Great Falls, Mont.  
March 20-23—Trenton, N. J.  
April 9-13—Stockton, Cal.

cialize in motor car castings and employ about 600 men. The capacity of the foundry is about 100 tons a day.

**Julius Andrae Is Dead**—Julius Andrae, Milwaukee, Wis., president of Julius Andrae & Sons Co., an old established jobbing house

in hardware and accessories, died Sunday, Dec. 2. He was 88 years old.

**Wheel Business Picks Up**—The truck department of the Auto Wheel Co., Lansing, Mich., has been increased largely in the last year and now has business enough to keep it in operation for six months. In the passenger car wheel department work has been a little slow recently, but an increase is expected. Recently a 20 per cent stock dividend was declared and the stock is being distributed.

**Chicago Manufacturers Hold Annual Dinner**—The first annual dinner and dance of the Chicago Automobile Manufacturers, associate members of the National Association of Automobile Accessory Jobbers, was held recently, with 150 present. The organization meets twice a month with the idea of co-operation not only between the manufacturers, but jobbers also. Jobbers and makers of the national association are invited to the meetings.

**Goodyear Friars Entertain Soldiers**—The Goodyear Friars, a fifty-man minstrel organization of the Goodyear Tire & Rubber Co., entertained the soldiers at Camp Sherman, Chillicothe, Ohio, with a minstrel and vaudeville show recently. More than 1600 men have left the Goodyear forces for the training camps, so the company takes much interest in the camps. C. W. Sieberling and P. W. Litchfield, vice-presidents of Goodyear, accompanied the entertainers on the trip.

**Canadian Maxwell and Chalmers Join**—The Maxwell Canadian sales office has been moved from Windsor, Can., to Walkerville, where the Chalmers Motor Co. has its Canadian headquarters. This consolidation of the offices is simply the Canadian phase of the situation here whereby the Maxwell company has obtained a five-year lease of the Chalmers Motor Co. It does not mean that the actual sales forces are consolidated, though Louis Logie is Canadian sales supervisor for both Maxwell and Chalmers.

**Silvex Co. Reorganizes**—The Silvex Co., Bethlehem, Pa., has reorganized and re-incorporated with additional capital to provide for increased business. It is making many plugs for use in aviation engines. The new stock consists of \$1,000,000 common and \$1,000,000 preferred. The board of directors consists of E. H. Schwab, president; J. H. Ward, E. B. Turn, W. M. Davidson and W. H. Lumpkin, all of Bethlehem. The company soon will move into a new concrete and steel factory.



MAXWELL TONNER ON LONG TRIP—Maxwell 1-ton truck which is making 2500-mile trip to all army camps with a load of 1 ton

# From the Four Winds



**A STUDEBAKER IN SOUTH AFRICA**—The car is equipped with a special body and carries repair material. With thirty-two other Studebakers it was used by the South African British army when it captured the Boer rebel, General De Wett, in a campaign

**HOW War Affects Rubber**—The war has increased the rates on crude rubber shipments from the ports of Singapore and Penang to the Pacific coast from \$24 to \$95 a ton. The Straits Settlements supply about 70 per cent of the rubber supply and of this the Akron factories use about half.

**Wisconsin Cars Increase 50,000**—Approximately 165,000 licenses for 1917 had been issued up to Dec. 1 by Wisconsin to private owners, indicating a net gain of nearly 50,000 motor cars in Wisconsin this year over 1916. The demand for licenses is practically over and applications for 1918 registry will be received after Dec. 15.

**Wisconsin Plans News Road System**—As the result of agitation started seven years ago by the Good Roads Association of Wisconsin and other agencies the Wisconsin state highway commission in 1918 intends to establish a department to inaugurate a system of road maintenance and supervision similar to that in effect in European countries for many years. The patrol system is now being worked out and is estimated to cost about \$750,000 during the first year.

**What the Detroit Club Did**—The Detroit Automobile Club is sending a blank to all of its members for data on tires to aid recovery in case of theft. This blank lists the make of the car, factory number, license number and the number and make of each of the tires, together with the name and address of the owner. This will aid co-operation between the club and the police department in recovering stolen cars, particularly in view of the fact that an ordinance recently has been passed stating that all dealers in used goods must be licensed. In the last year the club has handled seventy-five cases of car theft, sixty cases of arrest, investigated 130 cases of constables reported and 110 miscellaneous cases. It has assisted in the construction of good roads, conducted a six weeks' safety first campaign in the schools, assisted in killing pernicious legislation and obtained the

passage of equitable traffic rules. All this is in addition to the provision of the usual touring and road information, in which 7906 queries were answered. Signs were erected on main roads and poles were painted on 321 miles of road.

**School Adds Tractor Course**—In anticipation of the increased use of tractors the Michigan State Automobile School is including a tractor course in addition to the regular course. At present it has a Titan tractor, manufactured by the International Tractor Co., and others will be added. In the spring, plowing practice will be given.

**Three Years for This Road**—The last slab of the concrete highway between Hamilton and Toronto has been laid and the road is completed. It is 36 miles in length, 25 yards wide at the Toronto end and 18 yards wide on the Hamilton half. The road required 125,000 tons of stone as well as 70,000 tons of sand and 157,000 barrels of cement. Its construction was started in November, 1914, just three years ago. The highest grade before the work was begun was 10 per cent. In August, 1914, on the old road the census shows 525 vehicles passed a given point in a 12-hr. day. Last August the number had increased to 3840, or almost eight times as many.

**Montreal Sells All Show Space**—Already the all-round record smashing predicted for the National Automobile Show of Eastern Canada for 1918, to be held in Montreal, has begun. Several weeks ago the Montreal Automobile Trade Association, under whose auspices the show is held, allotted space to members. Every available inch of floor space has been taken. The total number of exhibitors of cars will be forty-five, while the total number of accessory exhibitors is eighteen, making a grand total of ninety-five makes of cars and 245 exhibits of accessories. This is a great contrast to the first exhibition held in Montreal eight years ago, when only thirty-four concerns exhibited. This

year the banners are to be discarded and a patriotic color scheme adopted. Each pillar of the building will be entwined with Union Jacks and the wall spaces between the windows will be covered with flags of Britain and the allies.

**Columbus to Better Camp Roads**—Because of the nearness of the national army cantonment at Chillicothe, Ohio, to the Buckeye capital, Columbus business men are backing the movement of county officials to have three roads between the camp and Columbus. One road is not sufficient to take care of the traffic. It is planned to improve three distinct routes and then enforce certain traffic regulations relating to motor trucks and passenger vehicles.

**Will Visit National Shows**—Texas dealers are going to visit the Chicago and New York shows. The Dallas dealers are anxious to attend the New York show. Most of the other state dealers desire to attend the Chicago show. It is likely the dealers of the state, who are affiliated with the Texas Automobile and Accessory Dealers' Association, will take a vote on which show the state delegation will attend. It is practically certain that Dallas dealers will attend the New York show, making the trip in a special train. The trip to Chicago will also be by special train.

**Detroit Considers Anti-Theft Ordinance**—The Detroit council ordinance committee is considering an ordinance that will require every dealer in used cars or second-hand supplies to obtain a license and report on all goods handled. In the last few weeks the thieves, particularly in the tire field, seem to have become more bold and, not satisfied with taking tires from parked cars, have broken into tire shops and cleaned out the entire supply. By the new ruling, the source of supply of all used goods could be traced, and any doubtful material questioned. It is estimated that the value of the cars, tires and supplies stolen each year totals almost \$2,500,000, and that about 500 cars are stolen each month.

**Texas Investigates Gasoline Pumps**—An investigation recently conducted by the authorities of Texas towns into alleged deterioration of gasoline on the part of dealers resulted in the finding of comparatively little practice of this kind. The discovery was made, it is said, that many gasoline filling stations are equipped with pumps which are defective or rather that are intentionally made to give short weight by the closing of the vent in the top of the pump. This causes the rubber hose which runs the gasoline into the tank to retain more than a pint of gasoline at each filling, it is claimed. In Dallas and other cities warning has been given that prosecution will follow unless all vents in the pumps are kept open.

**Wisconsin Fees Double Now**—Garages, salesrooms, repair shops and even banks and country stores are being placarded with signs issued by the office of the secretary of state of Wisconsin to correct false impressions relative to motor registry fees in this state. More than 2500 applications for 1918 licenses already have been received, accompanied by checks for \$5 and have had to be returned because the new law requires an annual license fee of \$10 beginning Jan. 1, 1918. Dealers and garages will pay \$25, instead of \$10, as heretofore. Much confusion and extra expense has been entailed by the lack of understanding of the requirements of the new law by private owners throughout the state.